Devoted to
TEXTILE
CHEMISTRY
BLEACHING
DYEING
PRINTING
FINISHING

OCTOBER 4, 1948
VOLUME 37, No. 20

AMERICAN DYESTUFF REPORTER

OFFICIAL PUBLICATION
of the
PROCEEDINGS
AMERICAN ASSOCIATION
OF TEXTILE CHEMISTS
AND COLORISTS

For dyed cotton yarns...

VAT COLORS

Vat colors yield the best over-all fastness properties available on cotton today. The Du Pont line includes Ponsol*—anthraquinone-type dyes—and Sulfanthrene*—thioindigoid and related dyes. They offer a wide range of shades with good penetration, uniformity and brilliance... are suitable for use in all kinds of mechanical dyeing equipment.

Let our Technical Staff work with you and help you turn out dye jobs which assure customer color-satisfaction. E. I. du Pont de Nemours & Co. (Inc.), Dyestuffs Div., Wilmington 98, Del.

*REG. U. S. PAT. OFF.

Du Pont Dyestuffs

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

FORMASET SR

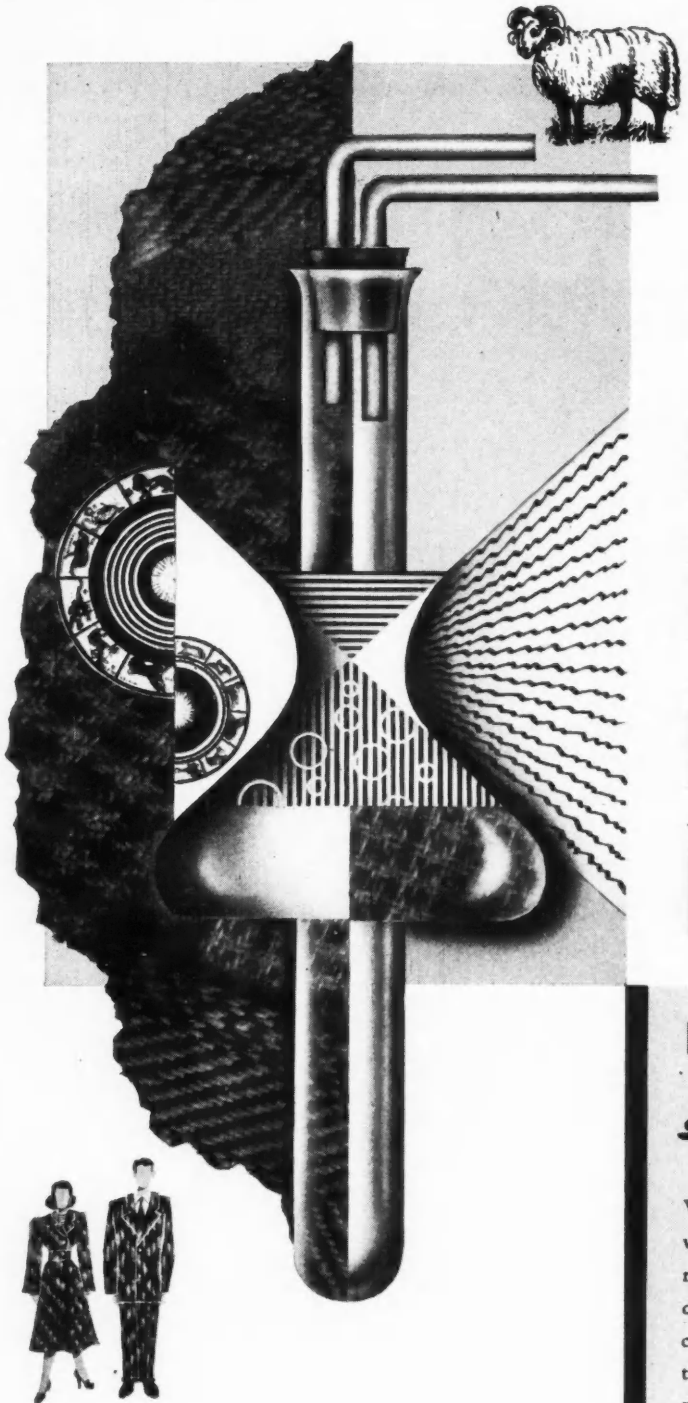
Reg. U.S. Pat. Off.

A NEW, ENTIRELY DIFFERENT, THERMO-SETTING RESIN FOR SHRINKAGE CONTROL OF RAYONS

A shrinkage control resin which cannot retain chlorine or develop amine or "fish" odors, FORMASET SR imparts a considerable degree of crush resistance. Shrinkage stabilization is complete for the life of the fabric.

Warwick technical advisors are available for consultation at all times.

WARWICK CHEMICAL COMPANY, Division of SUN CHEMICAL CORP., 10-10 44th Ave., Long Island City, N. Y.



a new fabric is born

BUT...

How Will it Scour?

With a yard of your fabric in the grease we are in a position through our research laboratory to give you a complete detergency analysis. Join our many customers who are enjoying this service that offers you the most economical procedure for scouring your fabrics.

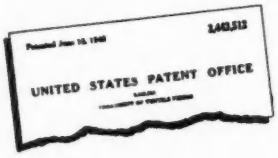
A Watson-Park representative will be glad to discuss your problems with you, or if you wish, just mail us the material you desire analyzed.

WATSON-PARK CO.
261 FRANKLIN ST. BOSTON, MASS.
FACTORY · LOWELL JUNCTION · MASS.

American Dyestuff Reporter, Vol. 37, No. 20. October 4, 1948. Published every other Monday. Copyright, 1948, by Howes Publishing Co., Inc., One Madison Ave., New York 10, N. Y. Domestic subscription, $5.00; Canadian, $6.00. Foreign, $10.00. Entered as second-class matter, Nov. 6, 1919, at the New York, N. Y., Post Office, under the act of March 3, 1879.

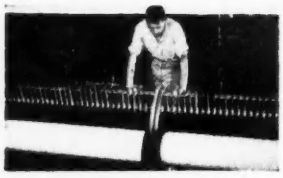
FOR YOUR INFOR M ATION

MILLS GET 10%-30% MORE YARN STRENGTH WITH SYTON IN WOOLEN, WORSTED SPINNING



SYTON: INVENTED BY MONSANTO

Monsanto research *originated* Syton. Monsanto technicians first recognized Syton's possibilities for better, faster spinning at lower costs. Now, the application of silica sols to any textile fiber as an aid to textile spinning is covered by U. S. Patent 2,443,512 issued to Monsanto.



Mulespinning, Lowell Textile Institute

PROVED IN MILL TRIALS

Monsanto was first in the "pilot plant" development of Syton for textile spinning. Here at Lowell Textile Institute, details of Syton application were successfully worked out on a small scale. Then a long series of mill trials was run. Now, Monsanto technicians are ready to use these lessons, and hundreds of others learned in mills now using Syton, to provide better spinning in *your plant*.

PROVED AGAIN IN SALES TO MILLS

Success in mill trials is confirmed by sales. Thirty-three more mills in one month means a rate of better than one a day! That's the latest sales report on this Monsanto pioneered product which is quickly becoming standard in the textile industry. More and more mill customers are the measure of Syton's practical success. It's delivering improved spinning in other plants now . . . just as it can in yours.

Practical results in more and more mills prove that Monsanto's Syton delivers from 10% to 30% added tensile strength. Syton's silica particles, evenly applied at the gill box or picker, control the rate that the fibers slide by one another. This controlled lubrication during drawing and spinning accounts for these typical mill reports:

- **"A 20% to 30% increase in tensile strength with Syton."**
- **"With Syton, we are obtaining a 29% increase in breaking strength."**
- **"Tensile strength of Sytonized yarns shows an increase of 25%."**
- **"A general production increase was obtained in all operations. Picking, carding, spinning, dressing and weaving have improved through use of Syton."**
- **"We are getting a consistent 15% increase in strength with a corresponding increase in production due to higher speeds."**
- **"Syton is providing very good results for us. The worsted yarn is 17% stronger, spins better, makes a better fabric and the finished fabric is 6% stronger."**

SYTON delivers these advantages:

Syton's advantages stem from increased yarn strength in woolens *and* worsteds. Check them ... and *get* them in your yarns with Syton.

FASTER PRODUCTION:

Because of increased yarn strength, the amount of twist can be reduced and production thereby speeded.

LOFTIER YARNS:

Less twist means loftier yarns, with tensile strength equal or better than the strength of untreated yarns of higher twist.

FINER YARNS WITH ALL GRADES:

Higher counts—closer to limit spin—for all grades of stock can be attained with Syton-treated yarns.

FEWER ENDS DOWN:

Reductions in ends down vary from 25% to 50% depending on the grade of wool.

BETTER SPINNING EFFICIENCY

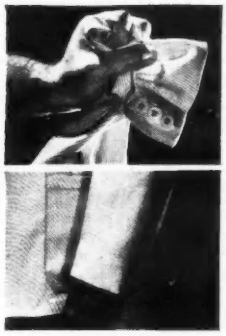
Syton produces more uniform yarn with less beard and thin spots, reduced fly waste, and better drafting.

For information on Syton, address 1 on the coupon.

Resloom, Syton, Sted: Reg. U. S. Pat. Off.

RESLOOM for wrinkle-resistant cotton

Another wrinkle-resistant Resloom-treated cotton on the market. This time it's the new Reeveweave, all-cotton fabric suiting by the famous Reeves Bros., Inc. With lasting wrinkle-resistance provided by Resloom, Reeves Brothers are joining the front-runners for next year's summer suiting sales competition. A feature, perhaps, to put up *your* sleeve when you're thinking of future sales.



RESLOOM for washable wool

And we *mean* washable. Bloch-Heller starts another season with Resloom-treated sports shirts of North Star's Nocturne fabric. And understandably so. They sold tens of thousands last season and their returns were less than .0004%—less than one in every 2,222! And Bloch-Heller's label read simply: "Treated with Resloom for washability. Wash or dry clean."

For information address 2 on the coupon.

Foamless STED *Cleans Better*

Textile cleaning *improved* because foam is eliminated! That's the result with Sted, Monsanto's non-sudsing detergent which succeeds at the toughest textile cleaning jobs, including wool scouring.

Here's why foam is a hindrance rather than a help in textile cleaning:

1. **Foam cushions mechanical action, delays results.**
2. **Foam often overflows on to mill floors, making the cleaning operation more difficult for personnel.**
3. **Foam is more difficult to rinse as it tends to redeposit scum it has carried off.**

The reasons *against* foam are the reasons *for* Sted. Maximum mechanical action, no overflows, ease in rinsing.

Sted is a scientifically built, non-ionic detergent and, as such, it rinses just as well in cool water and hard water. This means mill savings: In fuel to heat water for cleaning, in the amount of detergent necessary, and in the amount of water necessary. Multiply these savings ... plus the gains in cleaning time, and you have the reasons for Sted's success.

For information, address 3 on the coupon.

MONSANTO
CHEMICALS AND PLASTICS
SERVING INDUSTRY ... WHICH SERVES MANKIND

MONSANTO CHEMICAL COMPANY, TEXTILE CHEMICALS DEPARTMENT,
Desk No. ADT-10 140 Federal Street, Boston 10, Mass.

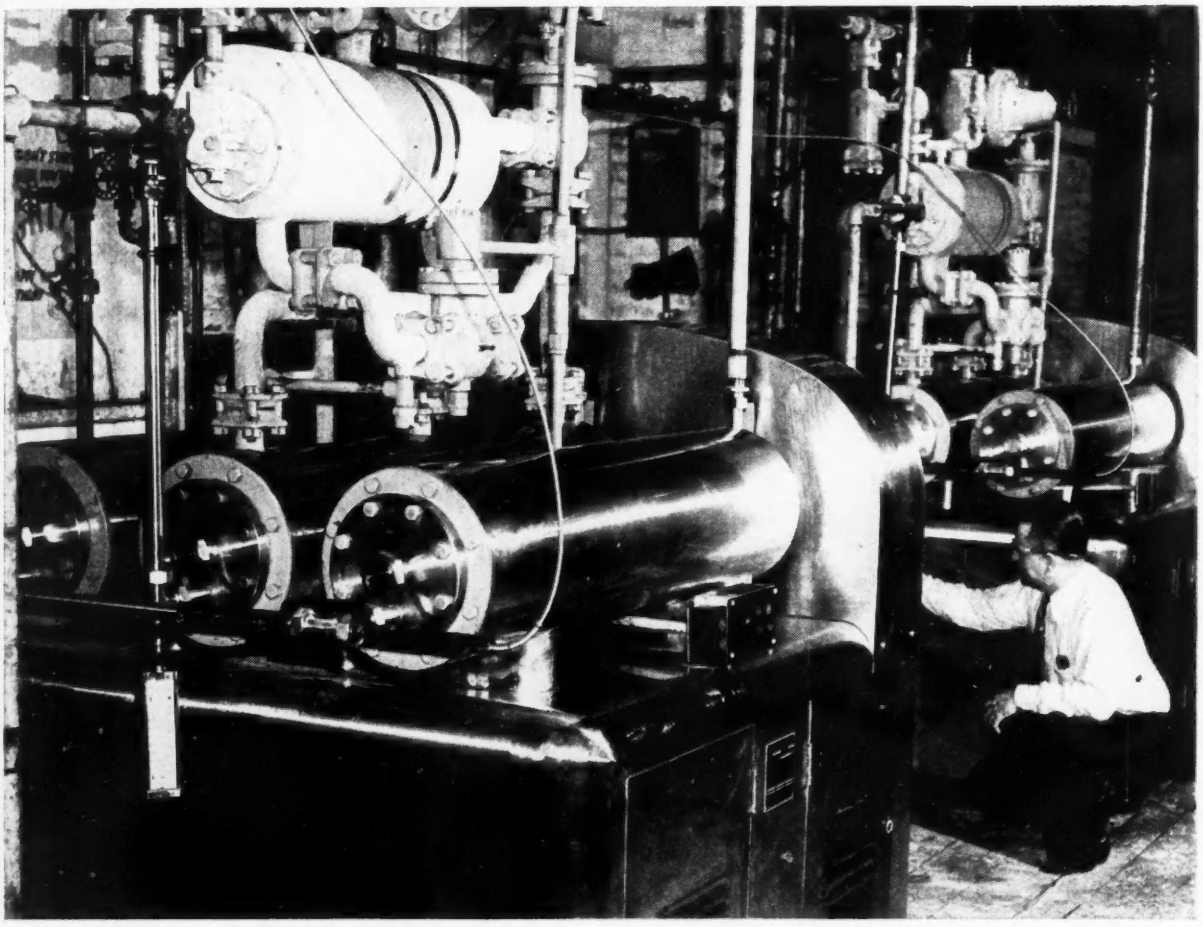
Please send me information as checked below:
☐ *No. 1;* ☐ *No. 2;* ☐ *No. 3*

Name _____ Title _____

Company _____

Address _____

City _____ State _____



Aspinook's vat paste process goes "Votator"

VOTATOR starch processing apparatus is out of this world in comparison with open kettle methods. Ask William A. Broadfoot, president of Aspinook Corporation.

These Votator units were recently installed at Aspinook's Jewett City plant, and vat paste is now being cooked and cooled there at far greater speed and more economically than before. Furthermore, the paste is of finer quality, permitting an appreciable improvement in textile printing. Cooking and cooling are accomplished on a continuous, closed, controlled basis by Votator starch processing apparatus in about one-thirtieth of the time required with open kettles.

This allows higher cooking temperatures and assures the positive, uniform explosion of starch particles. There is no spillage, no spoilage. The Votator operation generally takes place in half the floor space and with less than half the manpower otherwise required.

Micrograph of vat paste heated for 15 minutes at 210° F by conventional open kettle methods.

Micrograph of vat paste heated for 30 seconds at 230° F by continuous, closed Votator method.

THE GIRDLER CORPORATION, VOTATOR DIVISION, LOUISVILLE 1, KENTUCKY

150 Broadway, New York City 7 • 2612 Russ Bldg., San Francisco 4 • Twenty-two Marietta Bldg., Atlanta, Ga

Votator

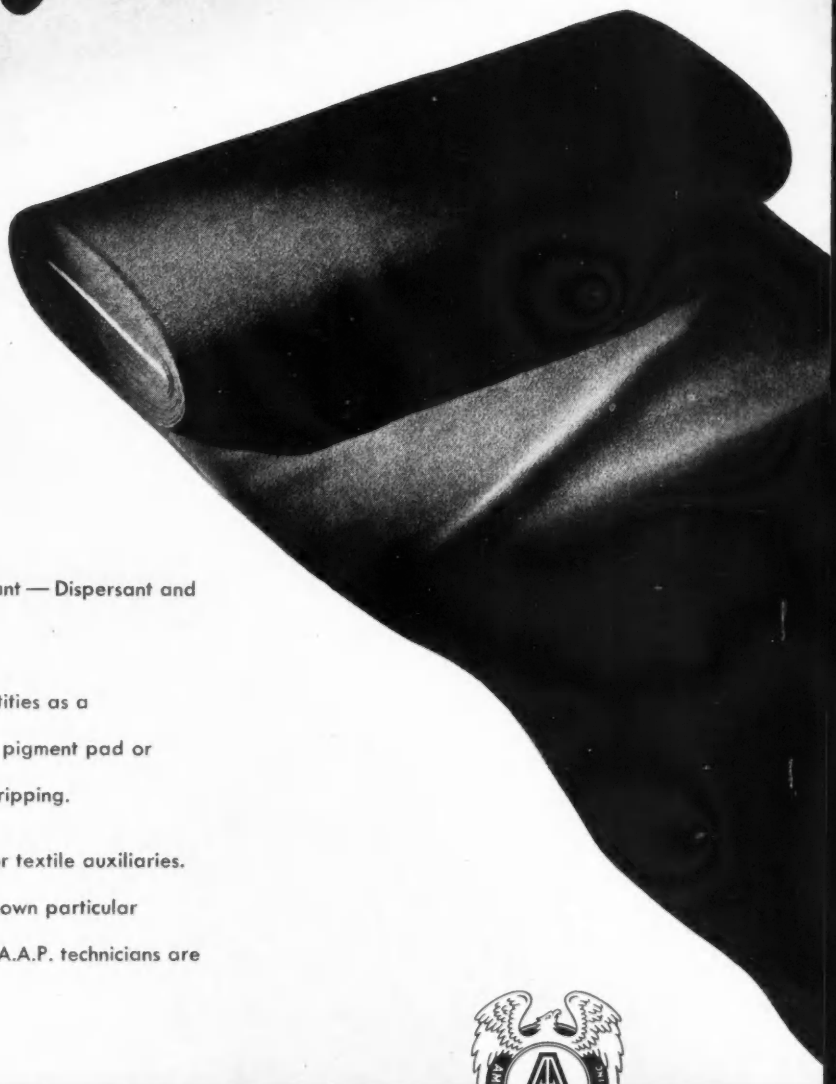
INDUSTRIAL STARCH PROCESSING APPARATUS

VOTATOR is a trade-mark (Reg. U. S. Pat. Off.) applying only to products of The Girdler Corporation

A Textile Utility
Product of
Wide Application

Levelene*

- preparing
- dyeing
- finishing



An effective Leveling agent — Penetrant — Dispersant and active Stripping Catalyzer.

Particularly well suited in minute quantities as a retardant for vat dyeing — either in the pigment pad or reduced methods — as well as for vat stripping.

Another of the A.A.P. range of superior textile auxiliaries. For detailed information regarding your own particular requirements consult our nearest branch. A.A.P. technicians are always happy to be of service.

AMERICAN ANILINE PRODUCTS, INC., 50 Union Square, New York, N. Y. • ***Plant:*** Lock Haven, Pa.
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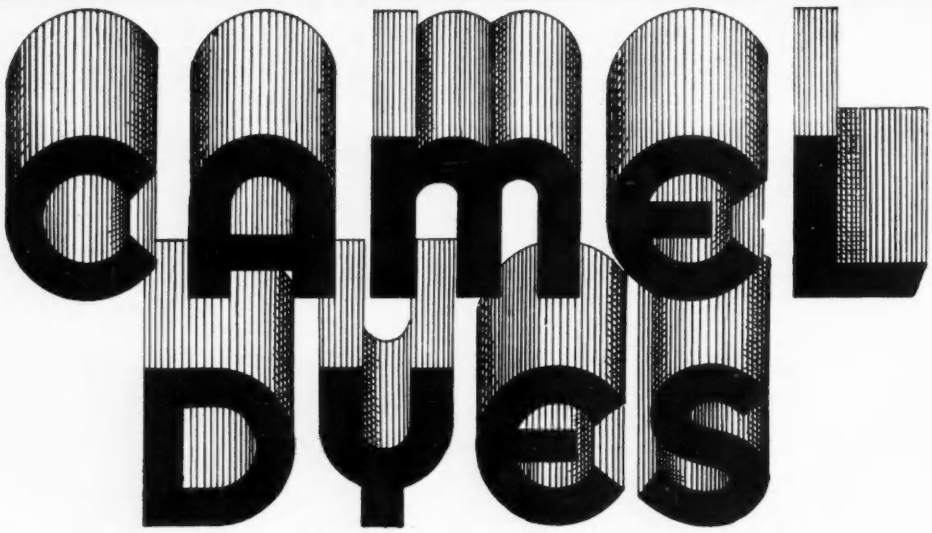
Chattanooga, Tenn. • **Dominion Anilines & Chemicals Ltd.** • Toronto, Canada • Montreal, Canada

*Reg. U. S. Pat. Off.



THE CAMEL LINE OF
DEPENDABLE DYESTUFFS
has served the textile mills of America without interruption since 1876.

This broad experience assures
PROMPT • EFFICIENT • ECONOMICAL SERVICE
TO MEET ALL DYESTUFF REQUIREMENTS

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An improved cation action finish

RESISTANT TO WASHING & DRY CLEANING

REFINED PRODUCTS CORPORATION

Lyndhurst • New Jersey

• Manufacturers of PERMA-CIDE, the approved, outstanding, mildew-proofing agent

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New England Representatives: E. L. LEGG, P. O. Box 597, Providence, R. I.
CLARENCE E. MOSS, 19 Wilson Ave., Rumford (16), R. I.
CARBIC COLOR & CHEMICAL CO., INC., 68 Pine St., Providence, R. I.

California Representative: SIDNEY SPRINGER, 2300 S. Vermont Ave., Los Angeles 7, California

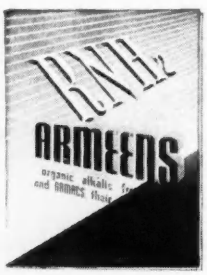
Canadian Selling Agents: Carbic Color and Chemical Co., Inc., 56 McNab Street South, Hamilton, Ontario

Exporting Agent: Chem-Col Company, 82 Wall St., New York City

WANTED!

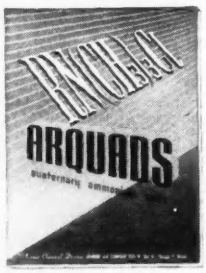
by more and more textile chemists

ARMOUR'S "CHEMICALS FROM FATS"



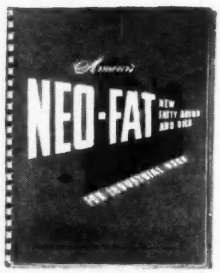
NAME: ARMEENS

Also known as aliphatic amines—and their partners the Armacs (amine acetate salts). Wanted as: cationic emulsifiers, detergents, germicides, rodenticides, mildew resistants, fire-retardants, penetrants, water-repellents. For more information write for booklet "RNH_2... Armeens and Armacs."



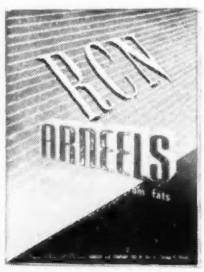
NAME: ARQUADS

Also referred to as Armour's alkyl trimethyl ammonium chloride compounds. Wanted for these indicated uses: cationic softeners for rayons, synthetic fibers and resin-treated fibers; germicides; cationic emulsifying agents; algae controllers. You'll also want the booklet "$RN(CH_3)_3Cl$... Arquads".



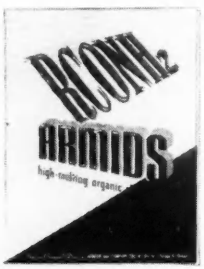
NAME: NEO-FATS

These pure fatty acids, made possible by Armour's patented fractional distillation process, are wanted as: starting materials for synthetic detergents, resin coatings, emulsifiers, wetting agents, water-repellents, softeners, lubricants. Send today for the helpful booklet "Neo-Fats".



NAME: ARNEELS

Also called Armour's aliphatic nitriles. Wanted for: softeners, rodent-repellents, lubricants, water-repellents, intermediates for specialty textile chemicals. Get instructive help from valuable booklet "RCN . . . Arneels".



NAME: ARMIDS

Alias Armour's aliphatic amides. Wanted for following textile applications: finishing waxes, coating resin ingredients, water-repellents, plastic anti-blocks. For detailed information write for booklet "$RCONH_2$ . . . Armids".

ARMOUR
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DIVISION

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Continuous

Niagara is a source of wonder to thousands of tourists every year. It provides a continuous spectacle that's never disappointing.

And you won't meet with disappointment, even in the new continuous processing, when you use Diastafor brand de-sizing agent—Type L.

Men who are in charge of finishing operations are used to dealing with varying conditions. They are faced with new de-sizing problems with almost every lot coming to the mill. They have given their preference to Diastafor—Type L—because they can depend on it for the help they need in solving these problems.

Diastafor gives good results in an unusually wide range of temperatures. It works well in a wide pH range. Bleachers and dyers using Diastafor know they can count on it for a fine finish whether they are working with cottons, rayons or mixed goods.

Diastafor helps to keep dyeing even and uniform, with no streaks or blemishes—never any impairment of tensile strength. Yard after yard, Diastafor gives you a fine hand, with a minimum of finishing headaches.

Please write us if you wish further information regarding the use of Diastafor de-sizing agents in continuous de-sizing. Our sales and technical staffs are always ready to help you. Address Standard Brands Incorporated, *Diastafor Department*, 595 Madison Avenue, New York 22, New York.

DIASTAFOR

A TRADE MARK OF STANDARD BRANDS INCORPORATED

Perkins 54″ three-roll hydraulic friction calender . . . thirty-five tons pressure . . . Sykes herringbone drive gears . . . cut spur friction gears . . . bronze bearings. Top, chilled iron roll, 12″ diameter . . . intermediate cotton roll, 22″ diameter . . . bottom, iron roll, 18″ diameter.

Perkins Hydraulic Power Unit . . . a high power unit which combines efficiency with quiet operation. Note the enclosed type housing for maximum safety and appearance.

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PERKINS HOLYOKE
1873-1948

B. F. PERKINS & SON, Inc.
HOLYOKE, MASS., U.S.A.
LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

do a complete job on your spun viscose .... wool blends

see to it that "both fibers" have the best possible light fastness

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VISCOSE RAYON

selected "Chlorantine Colors"

PLUS the brand new

CHLORANTINE FAST BLUE BCL

CHLORANTINE FAST GREY GRL

WOOL

Neutral Dyeing

NEOLAN Colors

LIGHT FASTNESS UNAFFECTED BY RESIN TREATMENT

When beauty sense makes dollars and cents...

Backed by years of "know-how," textile experts are well aware that a fabric is far more appealing, far more valuable . . . when proper processing enhances its natural beauty.

That explains why so many of America's leading mills, converters, finishers and dyers have turned to Colgate-Palmolive-Peet for high-quality wetting, fulling, scouring and dispersing agents.

Remember, there is a C.P.P. soap or synthetic detergent for every type of fabric—for every processing problem. Ask your local Colgate-Palmolive-Peet representative for details. Or, write today to Industrial Department, Colgate-Palmolive-Peet Co.

This vat-printed crepe, shown here in play-suit design for 1949, comes in cyclamen pink and aqua blue on a black background.

COLGATE FORMULA 25

For low-temperature washing ordinarily requiring olive oil soaps. Sold in eastern states only.

COLGATE WHITE SOAP FLAKES

High-grade thin white coco tallow soap flakes. Not milled or polished. 90% anhydrous soap.

ARCTIC CRYSTAL FLAKES

Made from pure tallow, guaranteed to contain 88% or more soap. Titer approx. 42°C.

ARCTIC SYNTEX A, T, AND M

Superior synthetic detergents and wetting agents. Unsurpassed for many processing operations.

COLGATE FORMULA 10

92% oleic acid soda soap in flake form for rayon processing, silk degumming, wool scouring, and other textile processing.

Colgate-Palmolive-Peet Company

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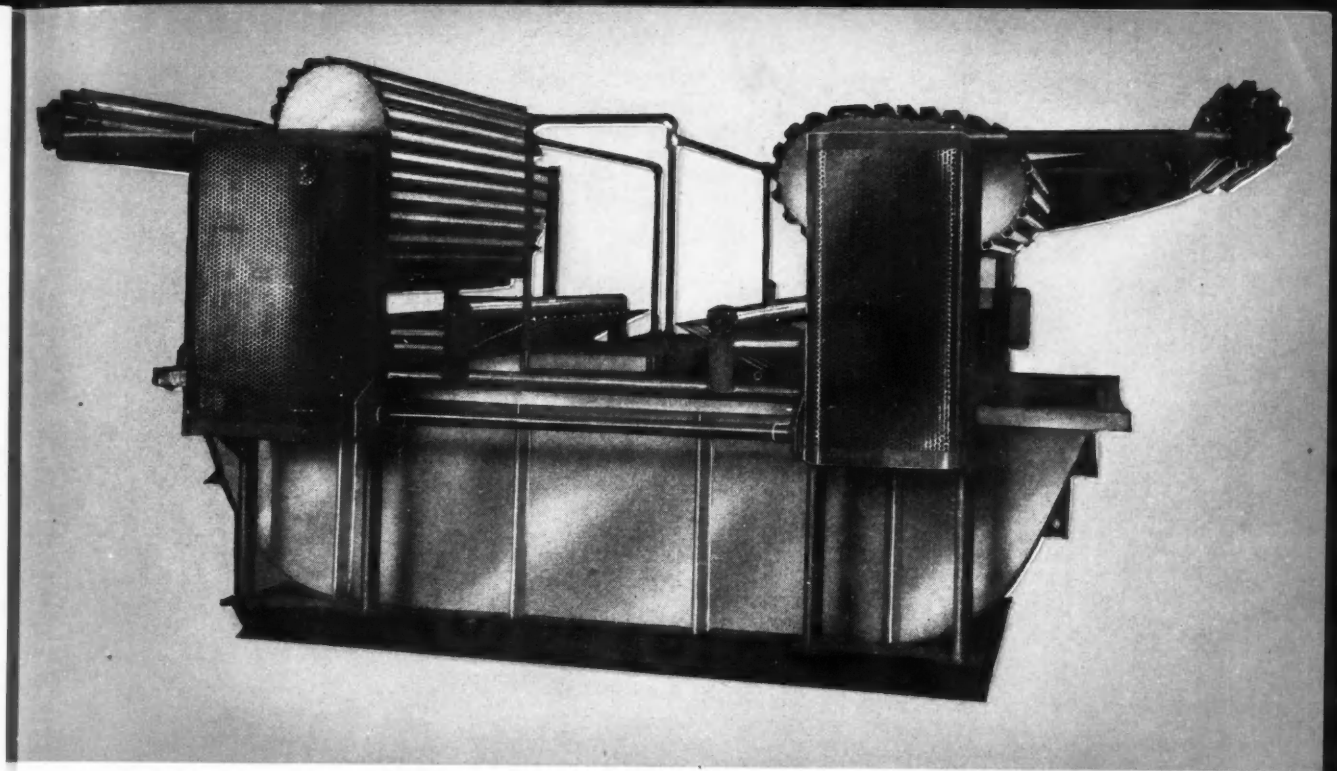


MAKING HISTORY

Our records show that 90% of those who have bought the new Continuous "Duplex" Dyeing Machine have reordered — some several times. The total in use is now over one hundred — a record acceptance in so short a time.

There are distinct reasons why successful companies have accepted this machine so quickly. The most important today is the greatly improved quality of the fabric after dyeing.

Users, also, report definite economies. Superior control features permit larger runs of yardage with the use of less dye liquor. In addition, continuous dyeing permits substantial time saving. One "Duplex" replaces two single line dye becks, plus.

The "Duplex" is being used successfully on a wide range of fabrics from lingerie sheers to suitings. It has an adaptability unmatched. Because of its low tension, it is now possible to dye continuously, fabrics which up to now have been handled only on single line machines.*

Why not contact us for full data?

**This machine embodies a number of patentable inventions and all steps necessary to secure patent protection thereon have been taken.*

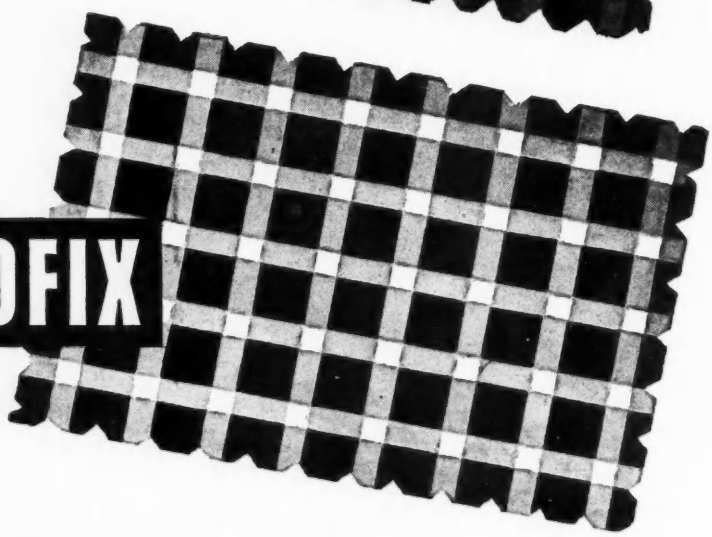
VAN VLAANDEREN MACHINE COMPANY

370 Straight Street, Paterson 3, New Jersey • Cable Address: Vlaanderen, Patersonnj, U.S.A.

World's largest manufacturer of machines for processing modern fabrics.

STOP COLOR BLEEDING

with *CULOFIX



Preserve crisp detail and contrast of prints by using time-tested Culofix as an after treatment.

Kill bleeding troubles no matter where they occur—in the finishing bath—batching up after dyeing—in cross dyeing, etc.

Improve water fastness of direct colors and impart a very desirable soft, full finish at the same time, thus eliminating an extra finishing operation. (Where no softening action is needed, Culofix L should be used.)

If fastness to water or prevention of color migration is essential to your direct color dyeings, write for Technical Service Bulletin #204-106.1. Our technical staff is at your service without obligation.

*REG. U.S. PAT. OFF.

Arkansas Co. INC.

Manufacturers of Industrial Chemicals for Over 40 Years

NEWARK, NEW JERSEY

formula for the future

RESEARCH is opening up a fascinating vista of new processes and new products every day. For half a century, "Virginia" has been in the forefront of these developments. Your "Formula for the Future" may well be your specialized knowledge of your own business, plus "Virginia's" engineering resources, plus "Virginia" chemicals.

"Virginia" Liquid Sulfur Dioxide (SO_2), 99.98+ percent pure, is a superior antichlor for the finishing of cotton goods. It is easy to store, to handle, and to use. Send for folder today. VIRGINIA SMELTING COMPANY, West Norfolk, Virginia.

VIRGINIA Chemicals

NEW YORK BOSTON DETROIT

50 YEARS OF SERVICE TO INDUSTRY

THESE 2 OLATE QUALITIES MEAN MORE EFFICIENT WOOLEN PROCESSING:

A soap solution must penetrate woolen and worsted fibers rapidly and uniformly for a good fulling and scouring job. If it doesn't, there's trouble ahead — dry spots, uneven fulling and non-uniform felting.

Olate solutions — fluid at temperatures far lower than you are ever likely to use — wet out fibers rapidly and evenly. You get excellent lubrication and thorough emulsification of dirt and oil with this pure, neutral, low titer textile soap.

And when Olate's work is done, it gets out *fast*. Olate rinses as efficiently as if fulls and scours.

Olate-processed woolens and worsteds *look* better . . . *feel* better. A month's trial will convince you.

Procter & Gamble

Olate "Safe and efficient for every textile soap usage

Color Lends Warmth to Beauty

For Winter Sportswear
as Colorful as Confetti
Specify

National Aniline Dyes

NATIONAL ANILINE DIVISION
ALLIED CHEMICAL & DYE CORPORATION
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Ensemble by Picard of Sun Valley

Special Ribbon Effects...

SPECIAL RIBBON EFFECTS are only one of many uses for the Xyno Resins. These stable aqueous dispersions of thermoplastic synthetic resins offer a wide range of new possibilities in sizing and stiffening effects from the moderate to the extreme.

THE XYNO RESINS

require no curing or high temperature setting. They contain no solvents and are compatible with alkalies, dilute acids and hard water. They do not putrefy or impose any hazards of toxicity or inflammability. No special operations or equipment are required for application.

There's Xyno Resin 362—a viscous dispersion for exceptional stiffness, especially on organdies, marquisettes and ninons. It makes an excellent back filling agent.

Also Xyno Resin 569—a water-thin dispersion for "springy" hands on fabrics and on nylons and other nettings.

And Xyno Resin AA 40—a versatile, general purpose, water-thin dispersion of especial interest to ribbon manufacturers and to finishers of cotton, rayon and acetate fabrics.

WRITE FOR
ONYX TECHNICAL BULLETIN T-2
for detailed data on the Xyno Resins and other Onyx Resin Finishes for Textiles.

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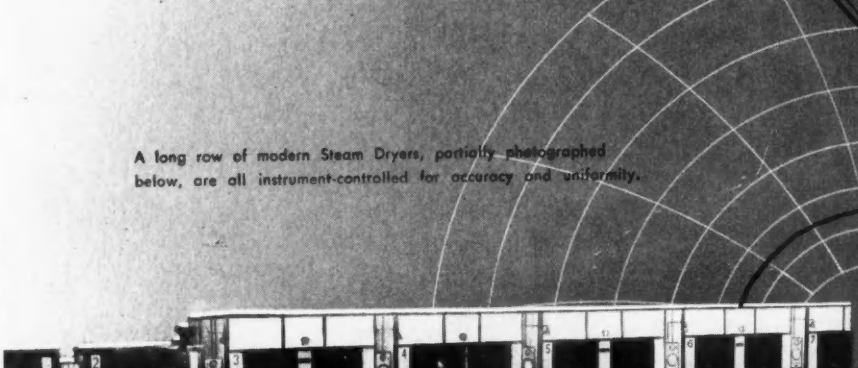

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VOLUME 37 OCTOBER 4, 1948 NUMBER 20

Gluconic Acid in the Textile Industry

GEORGE B. STONE

Technical Service Department
Chas. Pfizer & Co., Inc.

IN man's unceasing search for new fabrics with which to clothe himself and the unending experimental work upon new methods and ways to increase the appeal and durability of all textiles by means of new dyestuffs and novel dyeing and printing processes, the important role of acid assistants and souring agents in the textile industry cannot be overlooked. Of recent interest among the new developments in the textile industry in this post-war period is a unique acid, which because of its desirable and special properties appears to warrant consideration for application as an acid assistant and souring agent in this industry. The acid is gluconic acid.

Gluconic acid is an extremely mild organic acid derived by fermentative oxidation methods from the common sugar, glucose. It is a pentahydroxy, monocarboxy acid, $CH_2OH(CHOH)_4COOH$ and is one of the mildest, non-volatile, organic acids now commercially available. Because of its ease of lactone formation, in the manner of lactic acid, the anhydrous acid is difficult to prepare and the acid of commerce is a 50 per cent aqueous solution, a light yellow viscous liquid, having a slight acetous odor and a specific gravity of 1.24.

Sulfuric acid is probably the most common acid assistant employed in the textile field, principally because of its low cost. Hydrochloric acid occasionally is used as a souring agent but it is more expensive and has the disadvantage of its irritating volatility and a lack of contributing color fastness in many operations. The corrosive action of these two acids is well known and lends weight to their disadvantage for application due to their irritating quality in handling, corrosive action on machinery and equipment, as well as the ever-present danger of tendering goods, if not thoroughly removed by washing from the fabric or not employed with proper precautions.

Acetic, formic and lactic acids are the more common organic acid assistants substituted where possible for the more potent mineral acids. These acids, however, although widely used because of their cheapness, have their irritating qualities—emphasized in the dyehouse because of their volatility—their lack of contributing to color fastness and brightness in certain processes, as well as causing an occasional adverse effect on the goods. As acid assistants and souring agents, they leave something to be desired.

The lack of brilliance and luster of many dyestuffs under certain conditions may often be attributed to the presence of metal contaminants such as iron, copper, etc., in the dye bath or developing solution; not to the pigments in themselves. In this respect the hydroxy organic acids, e.g., citric or tartaric acids, which demonstrate the property of combination with these metal contaminants in solution forming stable complex ions, are often employed in special dyestuff formulations, thus retarding and inhibiting the reaction of the metals with the dyestuff and yielding as a result goods with a superior brightness and appealing luster. Gluconic acid displays this metal sequestering power to an even greater degree. Not only are most of the metal salts of gluconic acid readily soluble in water, but the complex compounds formed with traces of iron, copper, aluminum and other metals in solution are so stable that gluconic acid solutions adjusted to even an alkaline pH range of 8.0 to 9.0 will not result in the precipitation of the metal hydroxides. This sequestering ability towards metals may possibly allow the use of less dye in formulations containing gluconic acid—an important consideration in the factor of cost—and still result in equivalent or increased color brightness and luster, particularly in the presence of hard water. This phenomenon of metal sequestration may be accomplished in the presence of other acids by the addition of small quantities of gluconic acid and this indicates the possible application in admixtures of the more common acid assistants and souring agents.

Of the more common commercially available souring agents, gluconic acid exhibits the lowest rate of corrosion towards metal surfaces and metals at elevated temperatures and at the same time under similar conditions displays the least tendency towards the tendering of goods. Being readily soluble in water, it is easily removed by washing and no danger is present with regard to the fabrics becoming tender on the shelves. Gluconic acid is stable, non-volatile, and exhibits none of the irritating vapor qualities commonly encountered with most acid assistants during dyehouse operations.

Scouring and Bleaching

The scouring and bleaching operations are carried out to remove the natural impurities present in the fibers. This must be accomplished with the least undesirable effect on the fiber and the method depends principally on the different classes of textile materials such as wool, cotton, silk, rayon, etc. The impurities consist of oily materials, nitrogenous substances, gums and mineral constituents, in addition to natural color bodies present in the fibers which must be destroyed leaving a pure white finished material then

to be colored. Of the impurities indicated acid liquors are most commonly employed to remove mineral substances such as calcium and magnesium compounds.

The calcium and magnesium salts of gluconic acid are readily soluble and the use of dilute solutions of gluconic acid appear indicated for acid purification treatments for most classes of textiles. Wool or silk may be boiled in dilute gluconic acid liquors of reasonably low concentration, washing well before drying, although a small residue of gluconic acid in the goods will do no harm upon drying. Linen and cotton may be purified by treatment with dilute gluconic acid solutions if the temperature is maintained cold or at most lukewarm, but never hot or boiling. However, even in the cold, cotton and cellulose materials must be handled cautiously and with very dilute gluconic acid solutions, washing thoroughly after treatment. Neutralization of goods with dilute gluconic acid solutions after purification operations entailing the use of strong alkali may be of value.

Dyeing

In the dyeing of animal fibers, particularly wool and silk, with vat dyestuffs, color is developed by souring at temperatures of 60°-100°C. The acids usually employed are acetic, formic or sulfuric, the concentration and temperature being determined by the particular type of dyestuff and the process being employed. Because of its non-volatility and its metal sequestering power, the use of gluconic acid alone or admixed with the other common souring agents appears worthwhile in order to increase the brilliance of the resulting colors. With certain dyestuffs and processes gluconic acid may be found of value for exhaustion work and for rinsing or setting. Gluconic acid also will have application in combination with sulfuric acid in the dyeing of wool mordanted with chromium not only in the application of the mordant but in the formulation of the dyebath as well. The solubilized vat dyestuffs of the Indigosol or Algosol type are applied from an acid bath with a subsequent acid development usually by means of the nitrite or bichromate processes. In this type of formulation for wool or silk, gluconic acid has been found to be an ideal acid assistant, replacing the prior use of citric and tartaric acids and their derivatives. The range of concentration employed is 2-5 per cent gluconic acid (50 per cent) based on the weight of the goods and will depend to some extent upon the nature of the goods, the individual dyestuff, and developing process being carried out. Due to the mild nature of gluconic acid there is no danger of the acid assistant tendering the goods and for this reason it is particularly applicable in the solubilized vat dyeing of silk.

Many cellulosic fibers, such as linen, cotton and the regenerated cellulose fabrics which are vat dyed, particularly with those dyestuffs which are very sensitive to alkali, must be carefully soured at 40°C. with 2 per cent sulfuric acid solution and subsequently rinsed thoroughly. Due to the sensitivity of the cellulosic fibers to acid, in addition to the ever-present risk of the goods tendering due to traces of sulfuric acid remaining after washing, the application of gluconic acid for souring these alkali sensitive vat dyestuffs in linen, cotton and rayon goods is especially to be considered.

The largest consumers of solubilized vat dyestuffs are the cellulosic fibers. The application of solubilized vat dyestuffs to these fabrics is essentially a two-stage process in which the first stage consists of the application of the colorless dyestuff in aqueous solution to the cellulose and then a regeneration of the insoluble dyestuff by means of chemical oxidation. Three main processes—nitrite, bichromate and ferric—are most commonly employed in the second (oxidizing or development) stage, which is carried out in an acid medium. The use of sulfuric acid is general for the development of the dyestuff in these processes, but again precautions must surround its use because of its tendency towards tendering these acid sensitive fibers. The inability to remove the last traces of sulfuric acid from the fabric requires neutralization with dilute soda ash solutions after rinsing to prevent rendering the goods in storage. The mild action of gluconic acid towards this type of fiber would allow the development of pure brilliant colors and the high solubility of this acid might permit the omission of the neutralization step, providing of course thorough washing and rinsing were accomplished. The concentration of the gluconic acid required for this developing operation will vary with the individual dyestuff and the shade desired but lies in the range of 5-10 per cent gluconic acid (50 per cent) at 20-70°C. for 10-15 minutes. After rinsing, soaping the goods at or near boiling is carried out as for ordinary vat dyestuffs. The application of gluconic acid as an adjunct to sulfuric acid in the developing operation of solubilized vat dyes on cellulosic fabric seems to suggest the production of brighter colors.

For the development of Indigosols or Algosols on rayon and mixed fabrics considerably more dilute gluconic acid solutions should be employed, preferably in the range of 0.5-1.0 per cent gluconic acid at 65-75° C. for 2-3 minutes; time and temperature of development varying with the fabric and the individual dyestuff.

Printing

In the operation of textile printing as compared to dyeing the operation is essentially one of "local dyeing." In direct printing this is accomplished by forming the dyestuff pigment into a paste by means of a thickener and applying it locally in the presence of alkali and a reducing agent, which is activated at elevated temperatures. Color is developed by passing the printed material through a steaming or ageing device and the shade is developed by oxidation in an acid medium. The developer employed usually is sulfuric acid but it is not uncommon that citric or tartaric acid is present in the reducing formulation and developing solutions in order to yield brightness to the resulting colors. In this respect the application of gluconic acid seems indicated for much the same purpose as its stability and non-volatility will result in stable compositions.

Printing is more commonly accomplished with the solubilized vat dyes in much the same manner. Cotton, linen and cellulosic goods generally are printed with the Indigosol or Algosol dyestuffs. In this application gluconic acid finds increasing interest and use in the preparation of many print paste formulations. The preparation of the ammonium salt or substituted ammonium derivatives of gluconic acid yields print pastes which are stable for several weeks and give good results in either neutral or acid steam for developing times of three to five minutes. Of the many processes suggested for developing of Indigosols or Algosols the more commonly encountered ones are the dichromate, nitrite, sulfocyanide and chlorate processes. A typical print paste formulation including gluconic acid for Indigosol or Algosol application by the chlorate process is as follows:*

Formula

	Parts
Color	4
Glycerine A	4
Urea	4
Warm Water	28
Starch-Tragacanth	50
Sodium Chlorate 1:3	4
Ammonium Vanadate 1:100	2
Ammonia 28%	2
Gluconic Acid 50%	2

Reduction

	Parts
Starch-Tragacanth	65
Urea	4
Water	27
Sodium Chlorate 1:3	1
Ammonium Vanadate 1:100	1
Ammonia 28%	1
Gluconic Acid 50%	1

In addition to its application in print pastes, gluconic acid is suggested as an adjunct in the sulfuric acid developing bath for increasing the brilliance of the resulting colors in those processes where such baths usually are employed.

In the development baths for the printing of Indigosol or Algosol dyestuffs on

* General Dyestuff Corporation

(Concluded on Page 642)

Determination of the

Industrial Value of Detergents*

J. P. SISLEY
Ingenieur-Chimiste E.C.I.L.
Directeur general de l'I.T.E.R.G.

Translated by P. J. Wood
Technical Director
Royce Chemical Co.

1.—Methods for Determination of Wetting Power

In a study which appeared in No. 3 of the journal "Corps Gras Savons", methods proposed for the determination of detergent power have been reviewed. Many studies of detergent power have been presented. In evaluation for industrial purposes, detergent power is not the only quality which enters into the examination of the properties requisite for various applications. It is necessary to examine these products from the point of view of their action as wetting, foaming and emulsifying agents and as dispersing agents in the presence of the salts contained in hard water. The present study points out the methods which have been proposed for the determination of wetting power.

WHILE it is relatively easy to ascertain the wetting effect of a detergent, it is a delicate matter to make a choice or a judicious classification. This arises from the fact, that in spite of the numerous methods which have been proposed for the determination of wetting power, there does not yet exist one which is altogether exact and scientific. Moreover it seems difficult to agree upon a standard method. At best one can compare materials of the same nature. In comparing products of different classes, it is necessary to be careful in interpreting the results of wetting tests.

The different methods proposed are enumerated in this article. Opinions vary as to which is the most practical method; however, it seems that the simplest method, which is that of Erban, gives the most regular results. Herbig's modified method requires apparatus which is somewhat delicate and a certain ability on the part of the experimenter. As for the method of Servo-Schopper, this is applied principally in measuring the wetting power of mercerizing liquor.

A critical study of various procedures appeared in the Journal of the Society of Dyers and Colourists in 1932. *(1).*

Wetting Power

The surface of contact between a liquid phase and a gaseous phase constitutes the seat of a particular form of energy which is called surface energy.

If a unit of length is measured on the surface of a liquid, it is found to be subject to a certain force which is called surface tension.

Surface tension may be defined in the following manner. In considering a liquid phase, if one takes one molecule *A* in the midst of this liquid and describes around this molecule a small sphere of radius *r*, this sphere constitutes a zone of action of the surrounding molecules which determines the zone of attraction or molecular attraction. It is evident that in the interior of this sphere, the different molecules having an influence on *A* constitute forces which, acting on one another, tend to neutralize each other. If, on the other hand, one considers molecule *B*, taken on the surface of the liquid, it is only subjected to the force of attraction of the other molecules contained in the hemisphere formed in the midst of the liquid. There is no longer a tendency on the part of these molecules to neutralize each other but, on the contrary, they tend to concentrate themselves in one force directed toward the body of the liquid itself. The ensemble of all these forces at the surface of the liquid tends to reduce the area of the open surface; this has the effect of an extremely thin film opposing any increase in the surface area. The action of these forces is relatively restricted and is easily determined; in the case of water, for example, the thickness of the superficial layer is 0.6×10^{-8} cm. Surface tension is expressed as dynes per square centimeter. Various values are shown in Table I which has been established by Quinck.

This shows that, with the exception of mercury, amongst the liquid phases, water possesses the highest surface tension.

All those substances which, when dissolved in water either in true solution or colloidal solution, tend to lower the surface tension can be considered as wetting agents.

According to Gibbs' Law, the lowering of surface tension corresponds to a greater concentration of the substance in the superficial layer than in the body of the liquid itself. This has the effect of conferring on the liquid the property of forming froth, which property is designated foaming power. It is evident that this froth contains an accumulation of the dissolved body—for example the wetting agent—which gives the foam increased activity; this is the explanation of the

TABLE I

	Value of surface tension at the surface of separation		
	Air	*Water*	*Mercury*
Water	81	0	418
Mercury	540.	418	0
Carbon disulfide	32.1	41.75	372.5
Chloroform	30.6	29.5	399
Alcohol	25.5	..	399
Olive Oil	36.9	20.56	335
Spirits of turpentine	29.7	11.56	250.5
Gasoline (Sp. Gr. 0.7877)	31.7	27.8	284
Hydrochloric acid (Sp. Gr. 1.1)	70.1	..	377
Sodium Hyposulfite solution (Sp. Gr. 1.1248)	77.5	..	442.5

* Reprinted from Corps Gras Savons, January, 1944.

value of foaming agents and the very powerful action of soap foam in Schmidt's method of degumming silk.

Generally the surface tension of a liquid is measured in contact with air or with its own vapor, but it is equally possible to measure the surface tension at the surface of separation of two immiscible liquids; this is usually called the interfacial tension of the two liquids.

In evaluating the wetting power of textile assistants, one can either make tests of surface tension or use some practical method of testing wetting power.

Determination of Surface Tension

The surface tension of a liquid is measured by a large number of methods bringing into play various phenomena.

THE DROP METHOD.—When a liquid flows slowly through a vertical tube of small diameter, a drop is formed which detaches itself as soon as its weight p is equal to the total surface tension $2\pi r\gamma$ which is exerted on the circumference of the orifice of which the radius r can be the same as the interior radius of the tube.

We have then:

$$p = 2\pi r\gamma$$

from which we derive:

$$\gamma = \frac{p}{2\pi r} = Kp,$$

K designating the constant for a given tube. Thus the surface tension is proportional to the weight of the drops, the coefficient of proportionality depending on the radius of the orifices of the tubes used.

The pipette of Duclaux, very often used to make these estimations, has a capacity of 5 cc's between the upper gauge mark and the tip of the burette; the radius of the orifice is such that with water at 15° C. the pipette delivers 100 drops. The liquid to be studied can be placed in a burette suitably graduated so that the falling of a certain number of drops can be read as volume measurement on the graduated burette.

The stalagmometer of Traube corrects, by its construction, an important cause of error which is due to imperfect wetting of the tube by the drops. It terminates in a perfectly smooth outlet ground very fine, of such a diameter that the angle of incidence of the liquid to the glass is nil. The drop wets the entire surface and forms gradually. The apparatus is filled with the liquid to be tested by inserting the tip into it and sucking it up to the top mark on the stem, making sure that the plane surface is thoroughly wetted *(2)*. The number of drops formed between the falling of the liquid from the upper to the lower mark is counted.

The stalagmometer constructed by Kopaczewski and named by him the tonometer may also be mentioned *(3)*.

A critical review of researches made by the drop method will be found in an article by Louis Perrot in the *Journal de Chimie Physique (4)*.

To avoid the counting of a considerable number of drops, a device might be conceived by which the drops would be counted mechanically. The drops falling from the orifice could fall on a metal gutter, balanced like a see-saw, and in doing so, cause the opening and closing of an electric circuit. This could actuate a rotating mechanical counter on which the number of drops could be read.

Sufficiently accurate results can be obtained by means of the 2 cc. micro-burette of Labbé and Nepveux (No. 21 in the Pyrex catalogue). This apparatus permits rapid execution of a large series of tests. Generally 4 or 5 tests are made and the average is taken. The burette is calibrated with water. Given the number of drops obtained with water E and the number of drops N obtained with the wetting agent, the wetting power MS is derived from the equation:

$$MS = \frac{N}{E}$$

This method permits the comparison of two products or it can serve as a control on deliveries of the same product. It has been used by W. Kind and D. J. Andbach *(5)* and by Snell *(6)*, who has studied a certain number of commercial wetting agents. However, in the application to textile materials, it is not only lowering of surface tension which is active, the action of fat solvents, resins and fats enter in, as well as the structure of the fiber itself.

CAPILLARY TUBE METHOD.—In a glass capillary tube having radius r the liquid rises to a height h which is such that the weight of the column raised balances exactly the forces of surface tension $2\pi r\gamma$ which are exerted around the circumference of contact of the liquid with the larger volume of liquid; this gives the equation:

$$\gamma = \frac{hrdg}{2}$$

d indicating the density of the liquid and g the acceleration of gravity. It is necessary to use very fine tubes if it is desired to obtain surface tension determinations with precision.

This method is very little used in industry as it possesses two inconvenient features which limit its employment.

1. It is long, as it is necessary to wait sufficient time until equilibrium is attained.

2. One serious practical difficulty is the cleaning of the tube which is an awkward operation when the tube has been used with some solutions, particularly with colloidal solutions; it is practically impossible to pass a thread, however thin, through a tube of 0,5 mm. diameter much less through one of 0.3 or 0.2 mm.

METHOD OF "TEARING AWAY."—If an object is placed on the surface of a liquid, it is necessary, in order to tear it away from the liquid, to exert a certain force proportional to the surface tension and to the length of the contour which is in contact with the surface of the liquid. In the case of a ring, for instance, the force required to tear it away, f in dynes, is given by the following equation:

$$f = 2\gamma l$$

where l signifies the length of the circumference of the ring. It is quite evident that the length of the ring must be multiplied by two, since two films are formed one on the interior and one on the exterior of the ring.

Lecomte du Nouy has constructed a tensiometer of very easy manipulation in which he utilizes the torsion of a steel wire to balance the surface tension and to tear the ring from the liquid. This apparatus, slightly modified, permits equally well the determination of interfacial tension.

Another method, the principle of which was indicated long ago by Wilhelmy, consists in measuring the force exerted by a liquid on a plate partially immersed in it. This force $F = Al\cos\alpha$, taking l as the length of the sheet and α the angle of junction of the liquid with the plate. This method, which combines the advantages of the capillary tube in the respect that it is purely static and permits of absolute measurements, has not generally been used on account of the difficulty of obtaining that perfect wetting of the plate so necessary for the exactness of the tests.

In the tensiometer of Dognon-Abribat, which utilizes this system, this difficulty is eliminated by employing a ground (matte) plate. The force of surface tension which acts upon this plate is offset continuously by an electro-magnetic couple which is adjustable and definite.

The apparatus consists of a very thin plate of platinum, ground to a matte surface, about 2 cm. long which is suspended over the liquid; it is fastened by means of a cotton thread attached to the lever arm which is an integral part of a milliampere meter. The crystallizing dish which contains the liquid is raised very gently by means of an easy running rack and pinion arrangement until the under side of the plate lies level on the surface of the liquid; surface tension causes immersion of the plate. The test consists in balancing the couple due to surface tension by means of an electro-magnetic couple obtained by sending through the bridge of the milliampere meter-balance a current precisely graduated. The current is regulated so that the needle of the meter

assumes its initial position. The current is measured by means of a milliampremeter graduated either in milligrams or dynes. Calibration is effected by placing known weights on the plate. One can mark the correspondence in milligrams on the scale of the milliampere meter and also change the scale so that the zero no longer indicates no tension but 100 or 200 mgs.; a movable counter-poise along the length of the needle is used to make this adjustment.

Methods of Testing Wetting Power

Among the numerous methods which have been proposed of which a complete list cannot be given, here are the principal ones:

Junge *(7)* has conceived the idea of placing on the surface of the liquid to be examined, a substance wettable with difficulty, such as indigo or powdered sulfur.

Lindner & Zickerman *(8)* have proposed a method based on the increase in weight of a sheet of quartz glass coated with paraffin and plunged into the liquid for 10 seconds. These methods present no interest at all.

Karl Woltz *(9)* compares various commercial wetting agents by tying a cotton thread to a glass ring. The thread is introduced into the solution of 0.2% of each product to be tested, colored with a little Methylene Blue, in such a way that one-third of the thread is immersed. The speed of wetting of the thread is observed and the height to which the thread is colored by capillary ascension of the liquid. This method does not give exact results.

The most important methods are:

(a) The immersion method or Erban's method;

(b) The forced immersion method or Ristenpart's method;

(c) The centrifuge method or Herbig's method;

(d) The apparent shrinkage method or Servo-Schopper Method.

IMMERSION METHOD (ERBAN).—Erban *(10)* determines the time required by samples of textile fabrics of the same nature and the same dimensions to fall to the bottom of a bath containing the wetting agent and compares with the time in water or another wetting agent.

The discs can be cut out with a punch, raw cotton, bleached cotton or wool piece goods being used. They are placed on the surface of the liquid and the time required for the discs to sink to the bottom is noted. The liquid in which the disc takes the least time to reach the bottom of the vessel is the one possessing the greatest wetting power.

An analogous procedure has been devised by M. W. Kind *(11)* using squares of raw wool piece goods 4 centimeters square.

Bernardy *(12)* prepared woven skeins (?) which makes it possible to avoid errors due to retained air.

P. Krais tests wetting power on single threads which have been singed.

In the "funnel" method, the test is made under the surface of the liquid. The disc of material is placed in a funnel and lowered below the surface of the liquid being tested and the time is noted that it takes the disc to fall to the bottom of the beaker. This procedure, which is recommended by the I. G. Farbenindustrie, accomplishes the elimination of occluded air. In addition it avoids errors due to the accumulation of dissolved bodies on the surface of the liquid. In the case of assistants containing solvents, it often happens that these congregate or spread themselves out more ior less on the surface. It follows that there is frequently an accretion of the wetting power on the surface, particularly in the case of additions of butyl alcohol and pine oil, etc. When such a product is met with, it is recommended to determine the wetting power some time after dissolving. The liquid is allowed to stand over night in a separating funnel. The lower layer is run out and the wetting test made with this fraction. If the wetting power of this portion is distinctly less than that of the liquid before separating, this is an indication that there is a separation of the solvent on the surface and that the product is not well emulsified. It is useless to make tests by the funnel method. This product, being unstable, should be rejected.

DESCRIPTION OF THE ERBAN METHOD.—A small disc of wool felt is placed on the surface of the liquid to be tested. The time taken by the disc to sink to the bottom of the beaker is measured exactly with a stop-watch.

The question as to the material to be used in making wetting tests has been a matter of controversy. Morgan, Pratt and Pillett (13) recommended the use of pieces of cloth. Ermen *(14)* prefers wool flannel. Callan *(15)* points out the disadvantages of the use of cotton which possesses very marked variations in homogeneity and undergoes more easily than wool changes due to differences in pH. Heltzer *(16)* finds that the results are more regular with wool discs. Wool discs, having a diameter of 3 cm. cut out with a punch, are weighed, not that they have to be exactly the same weight, but only to eliminate those which show too great a difference in weight. These discs are kept in a closed container. It is obvious that the same felt should always be used in making comparative tests and that the fat content should be determined. The disc form possesses the advantage that the samples are regular and uniform and have more regular action in the wetting test. Squares of felt always have a tendency to roll. It is advisable not to cut the discs too close to the selvage of the felt cloth, the material in this locality exhibits a lack of homogeneity.

Beakers of the same capacity should be used in order that the depth of liquid may always be the same; the beaker should be filled almost to the top to facilitate placing of the disc level on the surface of the liquid. Forceps or an automatic release may be used to drop the discs on to the surface of the liquid. It is preferable to drop two discs simultaneously into the same bath, in this way the margin of error is reduced; the two discs should reach the bottom of the beaker at exactly the same time.

Usually 5 or 6 tests are made and the average of the times obtained is taken, eliminating figures which are too far out of line. In studying a wetting agent, it is necessary to test at concentrations of 0.1%, 0.5% and up to 2%. In order to make a control test on a product, the wetting power of which has already been determined, tests will be made at 1 and 2% according to the strength at which it is ordinarily used in the textile industry. From these figures, a curve is established for each product carrying the concentrations on the abscissa and the times on the ordinate.

In general, it is well to prepare a mother-solution of the wetting agent to be tested, some materials being difficult to dissolve or very viscous. An aliquot portion of this solution is taken and diluted to the desired volume with distilled water. It is advisable to prepare the solutions to be tested a little time, about 10 minutes, before being used, so that the liquid will be free from bubbles of air and any foam will have completely disappeared from the surface. Solutions should be used on the day they are prepared, the majority of wetting agents lose part of their activity on standing in solution; notably products of the soap class, although certain of them show increased activity atfer 24 hours, particularly certain esters of sulfo-ricinoleic acid containing solvents (sometimes because of the accumulation or separation of the solvent on the surface).

It is possible to make several trials in the same bath, but generally, not more than 20 tests should be made.

The temperature of the wetting test should be carefully controlled. In investigating a new product, tests are made at 20-60° C. and 80° C. For the last two temperatures a water bath containing calcium chloride is used, as in experimental dyeing trials.

Wetting agents act differently at dif-

ferent temperatures. Soaps, as a rule, show maximum wetting power at 40-60° C. Higher temperatures cause a diminution in wetting power, with the exception of soaps made from stearic acid. The sulforicinates act similarly but the difference is not so marked.. Products derived from alkyl or polyalkyl naphthalene show high wetting power in the cold which diminishes considerably with rise in temperature. The esters of ricinoleic acid and particularly those containing a certain proportion of solvents (butyl) alcohol or methyl hexaline) have wetting power which diminishes little or not at all on boiling.

The derivatives of fatty acid alcohols increase in wetting power as the temperature is raised, arriving at the maximum at 80° C. The presence of solvents in wetting agents changes their wetting properties. Wetting agents containing low boiling-point hydrocarbons are more active in the cold, particularly those containing a certain proportion of alcohol such as "tiers-solvent", dispersing some chlorinated solvent. Wetting agents containing high boiling-point hydrocarbons are more active at elevated temperatures but, in this case, it is necessary to take account of the dissolving action of the solvents.

In the testing of wetting agents, certain authors recommend concentrations of the wetting agent corresponding to wetting times varying from 3 seconds to 2 minutes. In general, to make good observations, the wetting time should be at least a minute; otherwise it is difficult to notice small differences.

Usually, distilled water is used; however, in certain cases, it is advantageous to make the wetting trials with hard water. In such cases a hard water of 22 degrees of hardness is prepared by adding calcium chloride to distilled water. It is noteworthy that, outside of wetting agents affected by lime salts, such as soap, hard water tends to increase wetting power. It is well, for this reason, to make tests with water of 0°, 15°, 30° hardness (French hardness scale).

DESCRIPTION OF RISTENPART'S METHOD.—The method of Ristenpart *(17)*, or method of forced immersion, is a modification of the method of Erban. It has been described by Landolt *(18)*. It can be carried out with either yarn or fabric. Generally, small discs of wool felt are used such as those previously mentioned. A fish hook is stuck through the wool disc, having a certain length of horse hair, say 15 cm., attached to the shank. Attached to the free end of the hair is a weight of 10 grams. The hair and the sinker are immersed, the felt disc being held a few millimeters above the surface of the liquid to be tested. The disc is released and the time it takes to reach the bottom of the beaker is measured with a stop-watch.

The remarks which have been made regarding Erban's method may be equally well repeated concerning Ristenpart's procedure.

A modification of this method has been described by Ruperti *(19)*; it consists in attaching a piece of material which is difficult to wet to the bulb of a specially constructed hydrometer and noting on the graduated scale of the instrument the sinking of the hydrometer into the wetting liquid in proportion to the penetration of the liquid into the fabric.

The immersion method has been further improved. J. R. Geigy uses an apparatus based on this principle in which the release of the brass wire attached to the fish hook is automatic *(20)*.

The official method of the American Association of Textile Chemists and Colorists is based on the same principle as that of Ristenpart. A description of this method has been published by Draves & Clarkson *(21)* and was published in 1937 in the Annual Year Book of the Association, Vol. XIV* (p. 184) see also 1931, *20*, 201). It consists in measuring the time necessary for a 5 gram skein of raw 2 ply cotton to sink in a solution of the wetting agent, the skein being weighted with an anchor furnished with a hook; the hook A (Fig. 1) weighs exactly 1.5 grams and consists of a piece of No. 12 copper wire 50 mm. long bent into the shape of a hook. The anchor C weighs at least 20 grams; it is suspended by means of a fine but strong linen thread B at a distance of 25 mm. from the hook. The anchor should be level and is provided with a ring on the top side to which the thread is tied. Pins can be set into the circumference of the anchor in the horizontal plane to center it during the trials.

To make the test a 5 gram skein of two-ply raw cotton (not boiled-off). A skein of 0.90 meter is most suitable; it can be made into a loop of 0.45 meter circumference by doubling. One end of the skein is hung on the hook with attached anchor and the skein is cut at the opposite end. The cut end is opened and smoothed by hand so that the threads are substantially parallel. The skein with hook and weight attached are dropped into the solution of the wetting agent contained in a 500 cc. graduated cylinder. The elapsed time between the introduction of the skein and the moment the hook touches the bottom of the cylinder is measured with a stop-watch. It has been found better to count the time to the point where the hook touches the bottom of the cylinder rather than the point when the weighted skein just commences to sink. The skein should be entirely covered by the solution to be tested and should be free from folds which would retain air. (Fig. 2). This method is followed with each concentration of the wetting agent.

* The reader is referred to the current Year Book for a description of the up-to-date AATCC method.

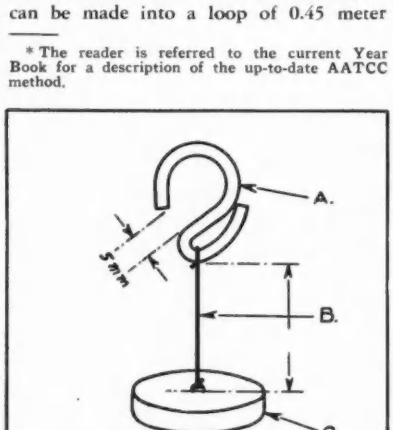

Figure 1

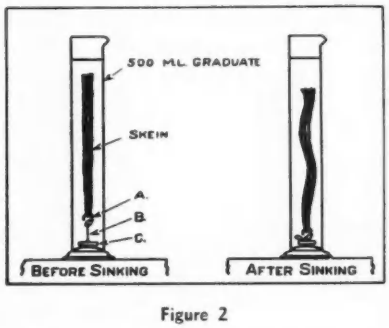

Figure 2

In order to test a wetting agent, it is recommended that a solution of 100 grams per liter be made, then 500 cc. of the following proportions are made up in a graduated flask and used for determination of wetting times: 5, 10, 25, 35, 50, 75, and 100 cc, corresponding to 1, 2, 5, 7, 10, 15, and 20 grams per liter. This series of concentrations covers practically all measurable wetting times for all wetting agents.

The wetting agent should be perfectly dissolved, with hot water if necessary, and afterwards diluted to 1 liter with cold water. An aliquot portion of this solution is measured with a pipette and diluted to 500 cc. in a graduated flask. In testing an unknown product one ought to approach practical conditions. The solution is poured into the testing cylinder. To obtain concordant results, it is necessary to wait the same length of time after pouring the liquid into the cylinder before entering the skein and its anchor, the recommended time is 40 seconds, which is just about the time required to attach the skein to the hook and get it ready for the trial.

In determining sinking time, it is necessary to use a uniform temperature. Room temperature (25° C.) is convenient because it permits the use of water slightly heated or cooled. For trials at higher tempera-

tures water which has been heated to a temperature a few degrees higher than the desired temperature is employed. The solution in the cylinder may be cooled if necessary by placing the cylinder in cold water for a few moments.

The method of interpreting the results is important. The numbers on the abscissae represents the logarithms of the number of grams of wetting agent per liter, the ordinates carry the logarithms of the times in seconds. Thus a wetting curve is obtained.

Those solutions giving the same sinking time have the same wetting activity. Equivalent quantities of wetting agents necessary to obtain the desired effect are given by reading the curve. A sinking time of 25 seconds has been chosen for comparison because 2.5-4 grams per liter of the best commercial products is generally employed in practice. If 4 grams of one wetting agent is required to produce a sinking time of 25 seconds and 5 grams of another gives the same sinking time, then the second one has only 80% the efficiency of the first product.

Comparison of These Methods

The two methods have their advantages and disadvantages.

That of Ristenpart is a little more complicated and depends on the skill and experience of the operative. It has the advantage of being less sensitive to the constitution of the bath itself and to the factor of occluded air.

Air bubbles are more easily eliminated from the felt by reason of the forced immersion; there is no risk of lessening the wetting effect. However the method of attaching the hook may interfere with results, depending on whether the fish hook is attached at the edge of the felt or in the center. Piercing of the felt with the fish hook should be avoided as that would facilitate passage of the liquid more in some tests than in others.

Ristenpart's method is quicker than that of Erban but not as precise as it requires accurate timing to the tenth part of a second giving minimum differences.

Erban's method approaches more nearly conditions met with in industry; the wetting bath must work by itself and if this method is more sensitive to the composition of the felt and to occluded air, it is nevertheless more exact than Ristenpart's procedure and more frequently used.

In certain dyehouses, a method based on that of Erban is used, which is very easy to carry out, even if it is not very exact.

They determine the wetting power of a solution of the agent being tested at a concentration of 0.2% at 20° C, 60° C. and boiling.

A 5 gram skein of raw cotton yarn is doubled in such a way as to form a sort of cylinder in which the threads are fairly homogeneous. This is placed on the surface of the bath and the time noted when the threads become entirely wetted. This method shows certain defects. According to the manner in which the skein is placed on the surface of the liquid there is slower or quicker contact between the fiber and the wetting liquor and the wetting is more or less regular. In addition, the matter of occluded air is a frequent source of error; nevertheless, this very simple test gives some indications.

It is quite evident that in all the methods considered, one can establish a comparative chart of wetting compounds now on the market. In fact, if these methods give comparative results these can only be absolute if one uses strictly the same types of material to test them. Wetting agents of the same name show notable differences in various samples of the same product. A comparative chart of wetting agents would only be of value if the manufacturers of textile auxiliaries would use uniform names for their products or classify them according to a very rigorous classification. As a matter of fact it is actually impossible to compare two products unless the same operator has them together. The present method permits the operator to determine the value of a new product as soon as he is in possession of the wetting power curve without having recourse to the product itself.

The examination of the wetting power at various concentrations is absolutely necessary in order to determine the usefulness of a product, the corresponding curve showing immediately the range of concentrations within which a wetting agent may be used in industrial application.

ESTABLISHMENT OF A WETTING POWER STANDARD AGREEING WITH BOTH METHODS.—In the stalagmometric method, the solution of the product to be tested is compared with water and the result expressed as a quotient, called wetting power, constant for the particular apparatus used. Tests carried out in other places with another apparatus of the same type, will show approximately the same results, if the work is carefully done.

In the second method, which one might call "chronographic", one can make comparison with water which does not wet, or one can compare with a commercial type which may vary in the manufacturing, or, if a standard sample is preserved, may vary with the age of the sample.

It is therefore necessary to use a standard which can be easily prepared of absolutely constant composition and easy to analyze.

A mixture of ethyl alcohol and water, testing 45° Tralles, prepared from 95% pure ethyl alcohol is a very convenient material to use as standard wetting solution. The wetting test is made at 20° C. Then the wetting power of a product under examination at the given concentration MC can be calculated from the equation:

$$MC = \frac{S}{T}$$

S being the sinking time of the product being tested at 20° C, T being the sinking time of the same felt disc in water-alcohol, 45° Tralles. The adoption of this method of comparing wetting agents, imperfect though it may be, would standardize this work of evaluating wetting agents in all laboratories where such tests are made.

Methods Using Centrifuge or Herbig's Method

Another procedure studied by various authors consists in determining the quantity of liquid absorbed by the textile material in a given time. A known weight of this is plunged for a shorter or longer period into the wetting bath, removed, squeezed or centrifuged. It is weighed immediately. The increase in weight gives the amount of liquid absorbed, this procedure was originally developed by Herbig who devised from it a quantitative *(22, 23)* method. It is probably unnecessary to add that for these quantitative trials it is necessary to work with known weights of the same material kept in an atmosphere having constant temperature and humidity. The impregnation of the material should be done at exactly the same temperature and for the same number of seconds. The wetting liquor is made up with 3 grams per liter of the wetting agent. This being done, the same centrifuge is always used and revolved for the same number of turns and the weighing of the wet sample is rapidly made. The results may be recorded graphically.

Herbig's method has been modified by various workers. Kennedy *(24)* describes a method which does away with the centrifuge. The operation is carried out with two skeins, one being plunged into a solution of the agent being tested and the other into a solution of a known wetting agent. By means of a lever arrangement the two skeins are simultaneously plunged into and removed from the two liquors before weighing. Evans *(25)* has demonstrated the exactitude of Herbig's method in comparison with other wetting test methods. This method has been described by numerous authors *(26)*; Evans' apparatus assures those conditions of standard immersion and hydro-extraction which are of prime importance in the obtaining of absolutely comparable results in these tests.

W. Seck and Lackman *(27)* employ an analogous method but the conditions of application are still more rigorous.

The cotton is used in the form of 40/2 yarn in skein form, neither boiled nor bleached. The quality of thread ought to be very uniform but the moisture content, if it is normal, is not of great importance.

A skein of cotton weighing 5 grams is weighed exactly (within 1 cg.) The strands of the skein are straightened by stretching and doubled to form a skein half the length of the original skein. This ring is attached to a clip, cut with the scissors at one end, and smoothed 8-10 times with the palm of the hand to open up and separate the individual threads. This treatment produces a physical condition of the skein and cutting with the scissors facilitates the rapid expulsion of occluded air by the solution being tested which penetrates better into the fibers. The skein and the clip are introduced into a cylinder containing the solution of wetting agent of known concentration. The yarn is immersed in this solution for a period of time measured by means of a stop-watch graduated in fifths of a second, then placed in the basket of a slowly revolving centrifuge, the entire contents of the cylinder being poured into the basket. The centrifuge employed is a hand driven machine with a gear ratio of 1:36 having a basket of 5.5 cm. diameter. As the duration of contact of the yarn with the liquid is an important factor in this assay, it is necessary to see to it that the skein shall be emptied into the basket with a variation of only a few hundredths of a second. One second after the transfer of the skein, the speed of the centrifuge is increased to 2,160 revolutions a minute and held at this rate during the desired time, then stopped suddenly by means of a brake. The skein is detached from the clip and weighed in a weighing bottle. The amount of liquid retained by the yarn is calculated against the original weight of the dry skein.

The amount of solution in the yarn after this treatment indicates the quantity of water absorbed. The percentage of absorbed humidity is a relative figure which depends entirely on the duration of the wetting time and the conditions of centrifuging. For this reason, it is necessary to adopt a type of procedure susceptible of being reproduced with exactitude and which, at the same time, removes a minimum quantity of the solution really absorbed by the fibers. The authors have adopted a standard time of 15 seconds for wetting the sample, the time of centrifuging being the same.

Tests to determine the efficacy of wetting agents have been made at various concentrations, at temperatures of 25°, 49° and 93° C. in three experiments. The authors have found that, with the exception of the sulfonated fatty acid alcohols, the actual efficacy of the wetting agents studied diminishes as the temperature rises. According to Lehner, the micelles of the sulfonated fatty acid alcohols are too large to produce their maximum effect at 25° C. At higher temperatures, a dispersion of the micelles in more efficacious dimensions occurs, resulting in a corresponding increase in surface activity and giving better penetration of the fiber by the solution.

Modified Herbig Method

Herbig's method has been modified by R. B. Forster-Uppal and Venkataraman *(28)* who describes a special machine for determining the wetting number, which they also call the Herbig number. This very precise method has been adopted by the laboratories of the Imperial Chemical Industries Co. The improvement resides principally in the fact that the wetting and the centrifuging are done automatically in the machine itself under conditions of time and temperature very rigorously controlled.

The apparatus (Fig. 3) consists of a threaded steel spindle A having one thread per millimeter which can be submitted to rapid rotation in the vertical position when the skein is being centrifuged. It is mounted on an axis B which allows it to be brought into a horizontal position for immersion of the skein in the liquid to be tested. An internally threaded screw nut D is mounted on the spindle the purpose of which is to control the number of evolutions made during the centrifuging. By means of the clutch C, the spindle is coupled with a single phase AC ⅛ H.P. motor. This permits the screw nut to travel along the spindle in both directions. To make a test, the motor is set in motion, the screw nut rises; as soon as the determined position is reached, the screw nut acts on the circuit-breaker E, the position being variable, and breaks the circuit, thus stopping the motor. As long as the screw-nut remains in this position and the spindle is vertical, the circuit remains open. The direction of rotation is reversed and the mechanical clutch is thrown out by hand. The spindle is then free to turn into the horizontal position. As long as it remains in the horizontal position, the circuit-breaker keeps the motor shut off. A skein of yarn furnished with a weight is hung on the hook F and lowered into the liquid to be tested. After having remained in the bath for the prescribed time, it is raised, the weight removed and the tube put back into the vertical position. This automatically starts the motor and the rotation continues until the controlling screw-nut reaches its limit. The time necessary to remove the skein from the liquid, detach the weight and replace the spindle in the vertical position is only a fraction of a second.

The skein is removed and placed in a tared weighing bottle. The motor is then stopped by bringing back the circuit breaker to its first position which permits the motor to be reversed bringing the screw-nut back to its lower position on the spindle.

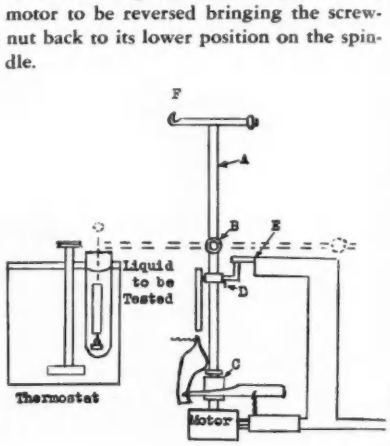

Figure 3

Procedure for Determination of the Herbig Number

In carrying out the test described by Evans *(29)* a skein of raw cotton yarn, weighing about 0.5 grams, free from size and conditioned to the temperature of the room, is used. A sinker weighing 10 grams is used to sink the skein and to keep it under the surface of the solution, which is contained in a 5 x 26 cm. test tube which is deep enough to immerse the entire length of the skein. The test tube is placed in a thermostatically controlled water bath. Evans uses 5 skeins for each test, but it has been found that three determinations are sufficient to obtain satisfactory results.

The centrifuge method is a precise mode of evaluating and comparing the wetting power of textile auxiliaries used in the textile industry.

These assays made by this method give a direct measure of the most important factor in the penetration of textile fibers, that is to say, a measure of the quantity of a solution absorbed by the fiber; the quantity of solution absorbed by the fiber after any lapse of time may be determined.

The centrifuge method permits determination of the maximum absorption of liquid by a fiber in solutions of all textile assistants. Tests can be made at all temperatures with the assurance that the result obtained are comparable with those obtained at all other temperatures. However, it has the inconvenience of being neither flexible nor rapid and is not at all suitable for control testing in industrial laboratories.

Method of Measuring the Apparent Shrinkage

Abramovitch *(30)* mentions the following method:

On wetting a heavily twisted wool thread and holding it vertically, it will be noticed that:

1. The thread slackens and increases sensibly in length. These phenomena do not take place in air or in the dry state.

2. The untwisting and elongation are not so much a function of the duration of the wetting as of the ease and rapidity with which the liquid penetrates the fibers, therefore a function of the wetting power of the aqueous ambient.

Based on these considerations, a method for determination of wetting power has been established. It consists in measuring the elongation of a thread impregnated with a solution of the wetting agent to be examined, at those concentrations and temperatures employed in practice in the textile industry.

The wetting power of a product is equal to the total elongation of a standard thread, measured after impregnation in an aqueous solution of this product at the given concentration, less the elongation of the same thread after impregnation in distilled water at the same temperature, this divided by the length of the thread used in the test.

Let L be the length of the thread used in the test (25-30 cm.),

a, the elongation in millimeters after impregnation in distilled water, luke warm or cold,

b, the total elongation after the action of the aqueous solution of the product being tested, likewise luke warm or cold,

X, the wetting power of the product tested is expressed by a figure resolved from the following equation:

$$X = \frac{(b - aL) \times 100}{L}$$

MODE OF OPERATION.—The apparatus employed is a regular burette graduated from 0-50 cc. in the top opening of which is placed a glass hook in such a way that the bottom of the hook is level with the zero mark on the burette.

The standard thread (high count, preferably twisted), is attached by one end to the hook, the other end being tied to a counterpoise consisting of a one gram weight. The length of the thread may vary from 25-30 cm. The thread with counterpoise is introduced into the burette and the graduated mark reached by the counterpoise is observed.

After having measured the exact length of the thread with a rule, the hook with thread is removed and the burette is filled to the zero mark (or better still to the 0.2 mark on account of the displacement of liquid by the counterpoise). The thread is reintroduced and the change in length noted. After a quarter of an hour at the most, the elongation becomes stabilized and one can then proceed to measure the length of the thread after treatment—value *b*. The only precaution to be observed is that the burette shall be exactly vertical. The thread-counterpoise combination constituting a vertical thread must not touch the glass, in order to eliminate entirely any resistance to the elongation.

The first trial should be made with soft water, cold and luke warm, (45-50° C.) to determine the value of *a*, which is constant for a given thread. It is obvious that once a standard thread is chosen, all subsequent tests should be made with this same thread. Each time that it is necessary to change the type of thread, it has to be tested anew to determine the value *a*.

A very ingenious procedure, known as the Servo-Schopper method is described by D. Rozenbrock *(31)*.

In this new procedure, the elongation is measured continuously and so it is possible to obtain a complete picture of the process of wetting, by taking advantage of the property of swelling possessed by fibrous materials when in contact with liquids. Even though the degree of swelling is too small to be easily evaluated, no difficulty is encountered in measuring the speed with which a twisted thread untwists during the swelling provoked by wetting. This phenomenon becomes even more notable when two threads of equal length are looped together, one with a right twist, the other with a left twist, and impregnated together. During the wetting, the individual threads untwist and produce a considerable shrinkage. By means of the apparatus (Fig. 4) the shortening of the pair of threads can be determined very simply, the shrinkage serving as a measure of the velocity of the swelling, which indicates the efficacy of the wetting. The apparatus consists of a base plate a carrying two upright standards b, b. On the left standard is a clamp c to which the fixed end of the pair of threads is attached. The right standard is furnished with an indicator d, carrying on its lower extremity a clamp e for the other end of the thread. A counterpoise f hung on the left arm of the indicating device provides the necessary tension for the thread held between the clamps. In addition, at the upper extremity of the standard on the right, is a scale h graduated in millimeters. For holding the liquid to be tested, a trough i is provided; this is shown in the testing position in Fig. 4. The trough is movable up and down by means of two brass levers of the same length on the ends of which the trough

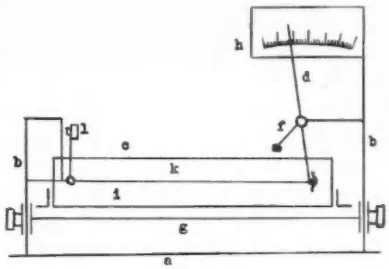

Figure 4

is carried, the other ends of the levers being connected by means of a cross-piece, the weight of which is greater than that of the trough full of the liquid to be tested. After disengagement of a catch, the trough is raised to the testing position, in which it is firmly maintained. A lug insures that the trough will always be at the correct height for the test.

To operate, the trough is locked in the lower position, then after filling it with the liquid to be tested, the pair of loops is stretched between the two clamps. It is well to see to it that the point of junction of the two loops is at point k at the middle of the line of tension. By means of a special device attached to the clamp on the left l, the position of the threads can be adjusted so that the needle which indicates the shrinkage of the threads will point to zero on the graduated scale. Then, after releasing the catch of the raising mechanism, the trough slowly rises to the testing position. During the immersion of the loops a stop watch is used and by reading the position of the needle on the scale every five seconds the course of the shrinking is noted, at first, then every 30 seconds. If a longer period between readings is adopted (which is more convenient in practice), for example 10 seconds, the operation can be checked with a metronome without the aid of an assistant. In general three tests are amply sufficient for a determination of wetting power. If, during the observation of the process of wetting, the readings are limited to following the shrinkage during the first minute, it requires exactly 5 minutes to make one evaluation, provided that the time consumed in attaching and detaching the loops does not exceed half a minute.

The Servo-Schopper method and apparatus can also be used to determine the wetting power of various preparations, as the device above described possesses all the qualities which make it suitable for this purpose. All that is necessary is to execute all evaluations with a standard thread having the same given quality, count and twist. If, for instance, the values obtained with the Servo-Schopper apparatus are placed side by side with the absolute indices of wetting power according to Herbig, a chart of measurements

is obtained from which it is seen that the Servo-Schopper values can be converted into absolute indices of wetting power without difficulty. If by the choice of an appropriate standard thread and after establishment of the relation between the values of Servo-Schopper and the absolute indices of wetting, the base of an absolute measure of wetting power has been created, it will finally be possible to determine the comparative wetting power of a product against other preparations and that independently, regardless of location.

Wetting tests carried out in different textile concerns do not give values which can be used for comparison; it frequently happens that there is a complete lack of agreement between the results obtained in one and the same establishment. With the Servo-Schopper apparatus it is possible to ascertain precisely the wetting power of the various baths used in textile treatments.

The apparatus in question lends itself particularly well to the examination of mercerizing liquors. In this case, on account of the considerable shrinkage which the cotton thread undergoes in the mercerizing bath, the employment of the two loops of thread can be replaced by the use of a single thread.

This method in comparison with the burette procedure has the advantage of easier reading, it is more convenient and more exact as the actual shrinkage is indicated in a much simpler way.

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Gluconic Acid—

(Concluded from Page 634)

silk and rayons or mixed cotton and rayon goods, acetic acid is often the acid assistant of choice. Gluconic acid, because of its mildness towards these fibers and non-volatility, would appear to be of interest in these particular operations.

Padding-Stripping-Weighting

The difficulties encountered in the penetration of the dyestuff into fabric, especially with the cellulosic fabrics such as rayons and mixed cotton-rayon goods, have resulted in the increased use of various padding processes. This operation consists essentially in dispersing the unreduced dyestuff on or in the fibers, reducing the dyestuff in a blank vat and then fixing by the usual oxidation processes. In certain padding liquors the weaker organic acids such as acetic or formic acids are employed, but entail the objection of their high volatility. The stronger non-volatile acids are usually not widely employed because of their destructive effect on these fibers. The mildness and non-volatility of gluconic acid would appear to make its employment in this particular process especially of interest.

The removal of color from dyed goods or stripping for redyeing is most often carried out under strongly alkaline conditions. The alkali is partially removed by rinsing and then souring is accomplished in the usual manner. Neutralization can be accomplished in this operation by the application of 2 per cent gluconic acid solutions and rinsing before drying or redyeing.

In the weighting of silk, the goods are often tendered due to the concentration of acid necessary to allow the metal salts that are usually employed to be put into solution. It is possible that the application of gluconic acid may be of value in this operation inasmuch as it would allow this operation to be carried out under higher or more nearly neutral pH conditions, which would have less tendering effect on the goods.

Finishing

The color and brilliance of many fabrics are greatly enhanced by treatment after dyeing with dilute acid washes or by dipping in weak acid solutions. This is particularly true of silks, rayons and regenerated cellulose fabrics. The mildness of gluconic acid towards these fibers makes it of especial interest in the brightening and restoration of luster for these types of goods. Silks and rayons may be passed through a cold or tepid bath of 5-10 per cent gluconic acid for 15-20 minutes, squeezed and dried in the usual manner. An additional rinse in water is not necessary. For cottons, cellulose acetate dyed fabrics and mixed goods the treatment is similar with the application of 0.1-0.5 per cent gluconic acid solutions, with a subsequent squeezing or whizzing and drying. The colors of most cotton goods, whether mercerized or not, are effectively brightened by the application of dilute gluconic acid solutions.

Laundry Work

The souring process in laundry work is commonly employed to obviate staining or tarnishing of the goods which is produced in the course of pressing or ironing and which is for the most part caused by the presence of metal contaminants such as iron or copper in the soaps, blues or in the water itself. Gluconic acid exhibits several properties which make it an ideal souring agent for this work. Not only are the metallic gluconates extremely soluble in water, but such metallic ions as copper, which causes greenish stains, and iron, which causes rust brown stains, are effectively sequestered and maintained in solution. It is readily soluble in water and does not have any irritating vapors. Of the common acids gluconic acid has one of the lowest corrosion rates on metal surfaces. It does not tender the goods and accidental excesses are not likely to cause undesirable results. Colors are brightened and white fabrics are made cleaner without altering the desirable texture of the goods. In practice the goods are normally given a final rinse in dilute acid solutions. 0.1 to 0.5% gluconic acid solution will be found most applicable.

Conclusion

It is to be indicated, in conclusion, that gluconic acid has as yet been untried in some of the applications suggested above but these suggested applications appear warranted on the basis of its apparently desirable properties as compared with other acids currently employed. In other applications, of special mention the machine and silk screen printing of cotton and linen piece goods with the Indigosol or Algosol dyestuffs by the chlorate developing process, it is receiving wide attention and interest in the industry and has been found of considerable value for the production of light fast brilliant color patterns and goods.

The multiplicity of operations and processes now current in the textile industry has made it impossible to cover but only a few of the more common suggested applications and uses of gluconic acid. Doubtless however, other possible applications will be apparent to those familiar and skilled in the art of this great industry.

Proceedings of the
American Association of Textile Chemists and Colorists

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October 4, 1948

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National Meeting and Convention Augusta, Georgia, Oct. 21-23

Headquarters: Sheraton Bon Air Hotel

Samuel L. Hayes to be Toastmaster at Annual Banquet

SAMUEL L. HAYES, or Sam as he is known by his host of friends, was born in Thomasville, Ga. on December 1st, 1889. His early education was in the Thomasville elementary school and high school from which he graduated in 1905. He graduated fifth in his class of 40 from Virginia Military Institute, Lexington, Va., with a B.S. degree in chemistry in 1909 and then attended Massachusetts Institute of Technology in Boston which honored him with an S.B. degree in 1911.

Sam has had wide experience in the textile finishing industry starting with the Millville Manufacturing Company, Millville, N. J. in 1911 as chief chemist and later, in charge of the dyehouse. In 1917 he went to the Lanett Bleachery and Dye Works, Lanett, Ala. as superintendent which position he held until 1921 when he became assistant superintendent of the Proximity Print Works in Greensboro, N. C. He moved to the Metropolitan area in 1924, assuming the position of superintendent of the Bronx Company, Inc. in New York. When this concern consolidated with the Easton Finishing Company in 1924 to form the Hartsville Print & Dye Works, Sam was appointed superintendent in 1928 and stayed in Hartsville until 1932 during which time his golf game started showing tremendous improvement.

In 1932 he became connected with the sales force of Ciba Company, Inc. with headquarters in Greenville, S. C. and was transferred in 1936 to the newly formed Charlotte office at which time he was promoted to Southern Sales Manager.

Sam is president of the Charlotte Alumni Association of VMI where his son, Sam, Jr. is an outstanding cadet. An interesting episode in Sam's life goes back approximately 10 years ago when he was considerably stouter than he is now. While on a trip to Lexington, Va. he observed an old beloved college mate whom he hadn't seen for 30 years, approaching across the parade ground. The two rushed to meet each other and each attempted to throw his arm around the neck of the other. The old beloved classmate, like Sam, protruded some two feet from the waistline and their attempts to embrace were touching, if ludicrous, as their arms were not long enough.

SAMUEL L. HAYES
Toastmaster at Annual Banquet

Sam is married and lives with his charming wife, Ruth, and daughter, Ruth, who teaches school at the Charlotte Country Day School. He has one married daughter, Lillian, and a son, Sam, Jr., as well as a grandson and a granddaughter.

He has several hobbies. He is an ardent golfer. He never uses a wooden club but his ball is always straight down the middle and he makes good use of his putter when on the green. He also enjoys the study of the formulations and combinations of 52 playing cards, particularly when arranged in groups of five. When he cannot get enough together to engage in this study he will compromise with a friend in a game of gin rummy. He loves to tell stories and has a choice collection for you as Toastmaster at the Saturday night banquet, October 23rd, in Augusta, Ga.

Special Train to Augusta Convention

Hotel Accommodations

Two special trains will be run from New York to Augusta, Georgia, and return as 300 members have already applied for space on them and they are about sold out. Mr. Beck, Passenger Agent for the Southern Railway at 500 Fifth Avenue, New York City, advises that allocations for space on these trains are being made as fast as specific cars are assigned to him by the Pullman Company. He will mail tickets covering these allotments directly to the individual members who applied for them.

Accommodations at the Sheraton Bon Air Hotel and Partridge Inn are also sold out but Mr. Newman, Convention Chairman, plans on using the Richmond and other downtown hotels in Augusta as well as some in Aiken if necessary. These hotels are, of course, some distance from convention headquarters but a good many private homes, more conveniently located, will be available so that all members who want to attend will find satisfactory accommodations.

From the large number who have already registered a successful convention is assured.

Annual Outing, Western New England Section

THE first annual outing of the Western New England Section was held on Friday, June 18th, at the Wallingford Country Club, Wallingford, Conn. An enthusiastic group attended, including a number of guests.

A golfing tournament was conducted under the direction of Joel Smith, pro at the Wallingford club. Other activities consisted of a dart tournament, a horseshoe pitching tournament and cards. Prizes were awarded to the following:

Golf

Low Gross, Member—Claude Allard, 94
Low Gross, Guest—H. Gamble, 92
High Score—Adolph R. Binder, 143
Most 6s—Arthur Nyquist (9)
Most 7s—Nelson Mellin (6)
Kickers—Manuel Silva
Nathaniel Glade
Robert Brownlee
John Dick
Robert Farwell

Darts

William Custer

Horseshoes

Edward Schuman

The festivities concluded with a dinner in the evening. The weather and sociability were both excellent.

Convention Theme: "Advancing Textiles through Research"

ANNUAL OUTING, WESTERN NEW ENGLAND SECTION
June 18, 1948, Wallingford Country Club
Photos by Walter D. Deuble

A MESSAGE TO MEMBERS

Regarding the New Campaign for Research Funds

A NEW nationwide drive has been launched by the AATCC for a 50 per cent increase in contributions to its research funds.

It is hoped to increase both the number of corporate members and their annual contribution by the 50 per cent figure. While the present list of contributing firms, numbering more than 300, represents a complete cross-section of the textile industry, there is much room for further expansion of the list.

The present membership of more than 5,500 includes nearly every chemist, dyer and technician in the textile field. Standards for consumer fabrics and testing methods to make them practical and usable constitute the major part of AATCC research along with work on the application of dyes and finishes.

In the light of the increasing importance of tests and standards to a sound industry and to each individual in it, many would be willing to help defray the rising costs of such work, either by joining or increasing their contribution, if they checked up on what they are getting for their money.

The campaign is being staged as a prelude to the National Convention in Augusta, Georgia, October 21-23, when once again the technical papers will emphasize the broad scope of the research advance by the Association and the industry as a whole during the past year. The papers are published as the Association's contribution to the advancement of the industry in general and almost every phase is touched upon. Since the Victory Convention following the end of World War II, the quality and timeliness of the technical papers has been outstanding.

EMMETT J. DRISCOLL
National Chairman
Corporate Membership Committee

Continuation of such work is essential if textiles are to maintain their position and obtain their full share of the consumer dollar in a competitive market such as that at present prevailing. The AATCC has been at the forefront in pointing out the needs for applied research as well as in broadening its own research activities.

Another reason for wide support of the Association is the fact that a great amount of work is accomplished at comparatively low costs because so much time is contributed voluntarily by individuals working in their own and company laboratories.

Corporate membership committees have been activated for the campaign in each of the 10 sections, including the two new sections, one on the Pacific Coast and the other in Western New England. The committee chairmen are:

Northern New England Section
Edward S. Chapin, W. C. Durfee Company, Boston, Massachusetts

Rhode Island Section
Kenneth J. Broden, Sherwin-Williams Company, Providence, Rhode Island

Western New England Section
John B. Dick, Pond Lily Company, New Haven, Connecticut

New York Section
Ernest H. Hart, Fair Lawn Finishing Company, New York, New York

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S. M. Cone, Cone Finishing Company, Greensboro, North Carolina

Southeastern Section
A. K. Haynes, Rohm & Haas Co., Inc., Atlanta, Georgia

South Central Section
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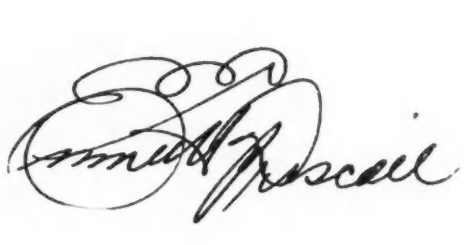
Mid-West Section
E. W. Camp, National Aniline Division, Allied Chemical & Dye Corp., Chicago, Illinois

Pacific Coast Section
F. T. Wilhelm, American Aniline Products, Inc., Los Angeles, California

Every member of the Association should take a vital interest in this campaign and cooperate to the fullest extent so that it may be brought to a successful conclusion. If your company is not now a corporate member of the AATCC point out the advantages of such membership. If your company is a corporate member emphasize the important need for increased contributions.



The Economics of Instrumentation*

CHARLES W. BOWDEN, JR.
Brown Instrument Company

IT would be a waste of time for me to attempt to discuss even briefly the importance of precise control in your industry. I am sure your daily experience proves its importance far more forcibly than I could demonstrate. Certainly your presence here exhibits your interest in the subject.

One of the reasons why industrial instruments are so widely used is the fact that they assist in obtaining more precise control. However, this is only one of several reasons.

In order to appreciate the whole value of modern control instruments it is first necessary to reconsider the objective of any plant or mill. Every manufacturing establishment must produce the best possible product at the lowest possible cost. A finishing mill is no exception. Any equipment which is installed in the mill must, therefore, justify all costs involved in its purchase, operation and maintenance by contributing to:

1. Product quality and uniformity.
2. Reduction of waste.
3. Reduction of production costs.

Instruments, if considered as process equipment, can be tested against each of these objectives in turn.

Product quality requires close process control. Once the conditions of time, temperature, etc., necessary to obtain the desired product quality have been determined, these conditions must be maintained without variance. If they are permitted to fluctuate at will, not only will product quality suffer, but uniformity, a very important factor, is practically lost. An excellent example of how time and temperature control contribute to quality and uniformity may be found in batch dyeing.

Batch Dyeing Control

Since the inception of the dyeing process, variation in shade has been tolerated as a necessary evil. However, new machine designs, improved process methods and superior materials have made automatic control a practical means for minimizing the problem.

One convenient arrangement for control of batch dyeing (Figure 1) employs a time pattern transmitter and a temperature controller. The Time Pattern Transmitter moves the control index of the temperature controller in accordance with a predetermined time-temperature relationship. Since the controller maintains process temperature in accordance with the setting of its control index, the temperature follows the predetermined-cycle with high precision. Thus, each successive lot of dyed goods is exposed to exactly the same processing cycle. The result is that shade variations, caused by processing inaccuracies, are practically eliminated.

Continuous Bleaching

Waste in the textile industry occurs largely in the excessive use of power, steam or expensive chemicals and in the production of sub-standard or rejected goods. One of the best methods for avoiding this type waste is the complete instrumentation of a process. In continuous bleaching, for example, remarkable economies are realized.

In order best to discuss the control requirements of a continuous bleaching range, a brief review of the process is helpful. Usually the process comprises two stages, the caustic boil-off and the peroxide bleach. Sometimes a third stage is added, an auxiliary chlorine bleach.

The first stage is nearly always necessary to prepare the cloth for effective bleaching by removal of dirt, oils, waxes, etc. and by swelling the fibers to facilitate penetration of the bleaching agent.

The equipment used in each stage of a bleaching range is identical. This permits the use of one stage ranges, since the cloth can be passed through the range once for the boil off, and after this operation is completed it can be passed through the same equipment a second time for the actual bleach.

Each stage of the continuous bleaching operation can be divided into three simple operations as follows:

1. Application of reagent.

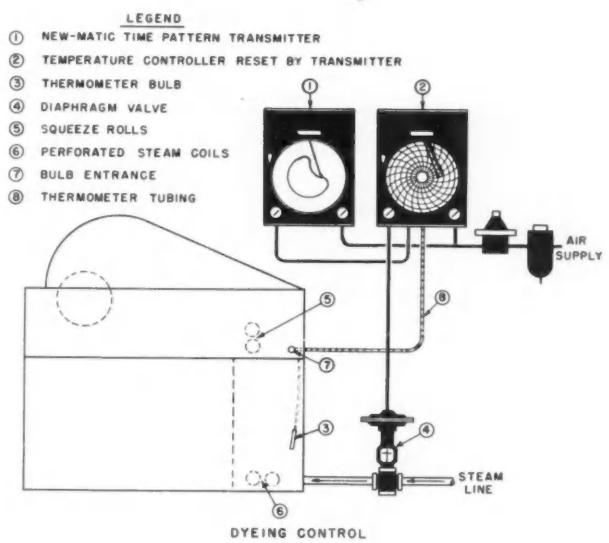


Figure 1. Batch Dyeing Control.

* Presented at meeting, Rhode Island Section, April 23, 1948.

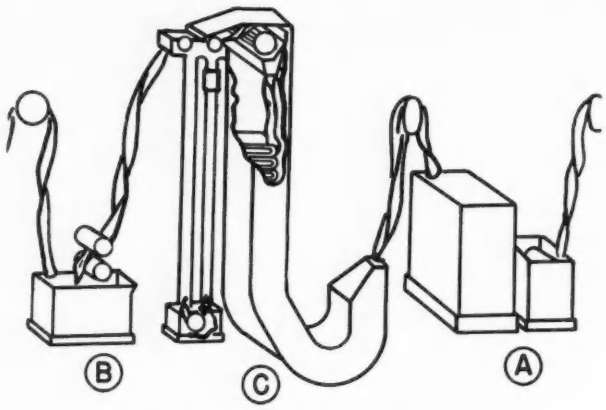


Figure 2. Equipment for Continuous Bleaching.
A. Washer and squeeze rolls.
B. Saturator with squeeze rolls.
C. J-Box.

2. Reaction.
3. Removal of reaction products.

A saturator is employed to apply reagent to the cloth. Reaction takes place in the J-box and reaction products are removed by a washer. These three units are shown in Figure 2 where (A) is the washer, (B) the saturator, and (C) the J-Box. In most ranges a washer is installed ahead of the first saturator to "wet-out" the cloth and remove extraneous dirt. Each saturator and washer is equipped with squeeze rolls to remove excess reagent and water.

Squeeze Roll Loading

The first requirement for producing uniformity of bleaching is to treat the cloth with a constant quantity of reagent. It is difficult to meet this requirement unless the concentration of reagent in the saturator, and the moisture content of the cloth both as it enters and as it leaves this unit, are fixed quantities. It is thus evident that loading of the squeeze rolls located before and after the saturator is critical.

Of the several methods of roll loading it is generally admitted that air pressure is the most flexible and is also quite reproducible. Control of pneumatically loaded rolls is easily obtainable by means of a pressure regulator and a dial type pressure gauge, as shown in Figure 3. A transfer switch is usually considered necessary at pneumatic loading stations to permit convenient opening of the rolls during threading and a push button station for inching the rolls is a desirable feature. A two-pen pressure gauge to record the loading of the rolls on each side of the saturator is generally considered necessary.

Saturator Control

Operating results from many bleaching ranges have proved that reducing the water content of the goods in the J-box improves the whiteness of the bleach. Therefore, it is desirable to operate the squeeze rolls at maximum design pressure, and to hold the water content at about 50%. In practice, however, a constant moisture content is rarely if ever obtained.

As a result of moisture content variation in the cloth, the rate of exhaustion of saturator liquor is also variable. Experience has shown that even when chemicals are delivered to the saturator at a constant rate, the level in the saturator rises and falls at an uneven rate. Obviously level changes preclude uniformity of saturation, and consequently level control is necessary.

An adequate system of level control for the saturator includes a bubbler type liquid level meter which operates a valve on the water supply line. With this type of control, chemicals are added to the saturator at a constant rate which is established by solution analysis, and water is added as required to maintain a constant level.

The need for automatic chemical control of saturator solutions has been brought to our attention numerous times. We are currently working on this problem and hope to solve it in the near future.

The use of temperature control in saturators is still a somewhat controversial point. However, operation of the caustic saturator at an elevated temperature has greatly simplified the problem of controlling J-box temperature, has reduced the quantity of steam condensate in the J-box, and has consequently contributed materially to uniformity of bleaching. Where the saturators are heated, temperature control is necessary for the economy it produces and for the safety of the operators.

Temperature control of peroxide saturators is even more important than in caustic saturators. In addition to the advantages previously described, it has another valuable function. If hot washers are used in the range, the temperature in the saturator will often rise above 120° F. and cause excessive decomposition of peroxide. This not only affects J-box temperature control, but may also reduce the concentration of peroxide in the fabric, both of which interfere with the efficacy of the bleach. For these reasons an "ElectroniK" potentiometer with throttling action is recommended for saturator temperature control. Saturator controls are shown in Figure 4.

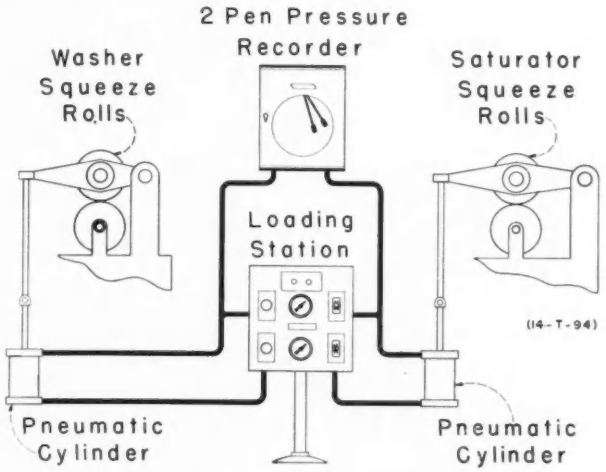


Figure 3. Control of Pneumatic Squeeze Roll Loading.

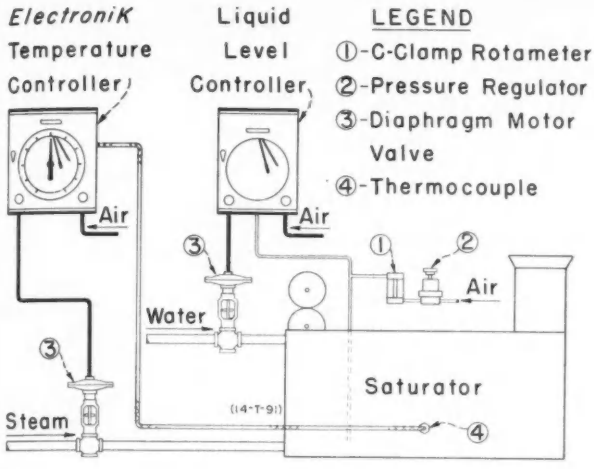


Figure 4. Saturator Controls.

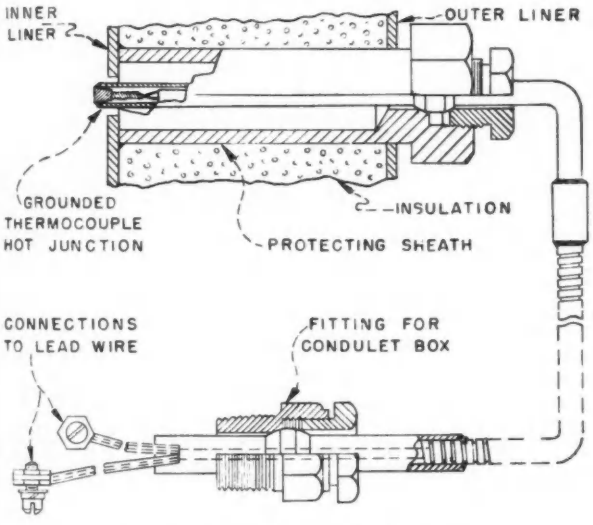


Figure 5. J-Box Thermocouple Assembly.

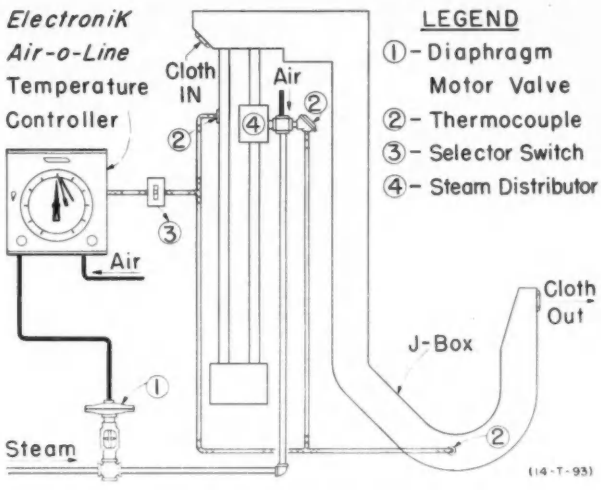


Figure 6. DuPont J-Box Control

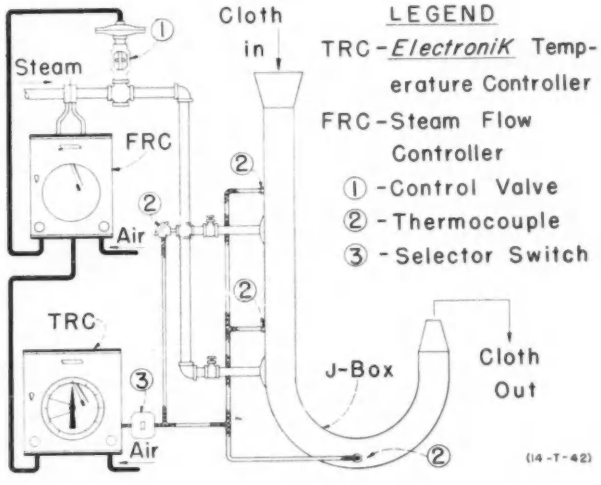


Figure 7. Becco J-Box Control.

The J-Box

Two of the most critical variables in continuous bleaching are the temperature and steam consumption of the J-box. An excess of steam results in non-uniformity and low quality of bleach, because the chemicals are leached out and diluted by steam condensate. A deficiency of steam also produces sub-standard results because reaction temperature is too low. Temperature control maintains steam consumption at the optimum value.

The method for maintaining satisfactory temperature control in the J-box depends upon the type of J-box used. The Du Pont type incorporates a cloth heater to raise the cloth temperature to the optimum value prior to its delivery to the J-box. The cloth travels downward through the first section of the heater and then upward in the second section past the steam distribution chest. Upon reaching the top it moves to the plaiter which distributes it in the J-box.

The unit is controlled from a thermocouple (Figure 5) in the side of the first tube of the cloth heater. An ElectroniK potentiometer Throttlor controller measures thermocouple temperature and regulates the flow of steam to the cloth heater by means of a valve in the steam line. The control system is shown in Figure 6.

The Becco J-box is somewhat simpler in construction than the Du Pont. There is no separate heater in the Becco unit, and steam is introduced directly into the J-box through a distribution chest located in the side of the box.

It has been found highly desirable to use a flow meter to control the delivery of steam to the Becco J-box. Temperature control is obtained by measuring cloth temperature in the box with an "ElectroniK" potentiometer which regulates the position of the set point of the steam flow meter, as shown in Figure 7. Very satisfactory control is gained by this method.

Control of Washing

The washing operation of a bleaching range is also highly important, since inadequate washing can cause innumerable difficulties. In general cold washing is not satisfactory, but in some cases where a

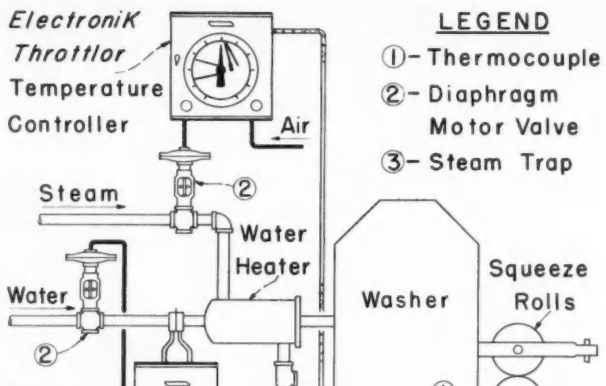


Figure 8. Washer Water Flow and Temperature Controls.

copious supply of cheap water is available, cold washing has been successfully used.

Normally, however, hot washing is preferred. Although some of the impurities and reaction products in the cloth are easily removed by cold water, others are relatively insoluble or tend to adhere tenaciously to the fabric. Hot water is usually required to remove these. Furthermore, hot water is less likely to permit redeposition of such contaminants on the fabric after they have been loosened in the steaming operation. Often where water costs are appreciable, hot washing actually effects an economy, since the steam used costs less than the water saved.

Where hot water washing is employed, economy of operation requires both temperature and flow control of the washer water. Temperature control precludes the waste of steam and prevents dangerous overheating. Water flow control is necessary to conserve both steam and water.

The instrument for temperature control is identical to those used for saturator and J-box temperature control. A recording meter is used for flow control. These instruments are shown in Figure 8.

For obvious reasons the speed at which cloth enters a bleaching range must be synchronized with the speed at which it leaves. Synchronization of these speeds can become a very difficult task unless indicating tachometers are provided for measuring them. Only two tachometers are needed, one at the entering end of the range and one at the exit end. The tachometers are calibrated in yards per minute. They can be attached to the drive mechanism of any convenient driving roll.

In order to provide a simple method for checking the heat economy of the entire range and a means for steam accounting, a flow meter is installed on the main steam line to the entire range. This instrument, in addition to fostering economy, also assists the operator in maintaining standard operating conditions.

The Economy of Bleaching Controls

Fortunately, at one of the nation's largest mills, the instrumentation of a bleach range was installed unit by unit, enabling the savings of each control unit to be independently identified. A master steam flow meter showed the savings which accrued as each control system was added.

With automatic control on J-boxes only, steam consumption of the range averaged 7750 lbs. per hour, as is shown in Figure 9. The addition of flow and temperature controllers for washer water, reduced steam usage to 7730 lbs. per hour. When complete instrumentation was installed only 4450 lbs. per hour of steam were used. This amounted to a saving of $36.00 per day or more than $13,000.00 per year on one range. Thus steam savings alone amortized the total instrument cost in less than one year. The savings in water consumption were equally impressive and additive.

Complete instrumentation also conserves peroxide and other chemicals, and helps to minimize accidents.

Of course, the most significant saving which accrues as a result of complete instrumentation is the decrease in quantity of spoiled or off grade goods. It is difficult to estimate the cash value of this economy because of differences in costs, and quantity of rejected material, between different types of goods and in different plants.

Cost of production is sometimes considered even more important than quality and conservation. The effects of instrumentation on production costs are manifested in several ways in addition to the savings in power and material costs. Included are avoidance of reprocessing, increase in rate of production, and increase in labor efficiency as well as trimming back of over runs. The avoidance of reprocessing is closely connected with high and uniform quality. This has been discussed before and does not warrant more than brief mention here.

During the current shortage of skilled operators of all kinds, instruments are particularly important for increasing the efficiency of labor. In any process, the

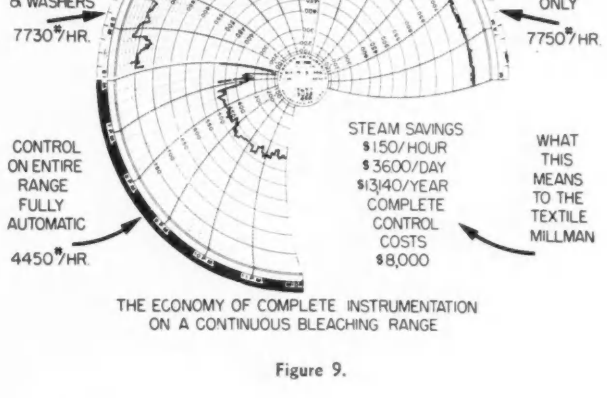


Figure 9.

installation of complete automatic control allows the trained operator to be upgraded to technician, since he is no longer required to handle all process details. In a position of supervisory capacity, he is able to operate several units instead of only one, and still has time available to train new operators when this is necessary. While labor economy is of considerable assistance in automatically controlled batch processes, it is far more important in continuous operations.

In a continuous process time ceases to be an independent variable. While it is frequently possible in batch operation to shorten or lengthen the time of treatment, to compensate for such factors as temperature differences, this is usually impossible in continuous processing. Because time of treatment is fixed, most of the other variables must also be fixed.

Changes in ambient conditions, steam pressure, and strength of reagents, are bound to occur in any process. These load changes, as they are called, necessitate changes in valve settings, etc. to maintain all variables at constant values. Since load changes of limited magnitude are constantly occurring, and since each valve adjustment usually necessitates a corresponding adjustment of every other valve, it will easily be seen that manual control is impractical.

Even if it were economically sound to place a man at every valve, there is no way on earth to keep his attention continually focused upon his job. Instruments, on the other hand, operate constantly, making just the right amount of correction at just the right time. Thus, the process remains on the beam because it never has a chance to get off.

The principal reason for continuous operation is that it produces a larger output at lower cost and at higher average quality. To install continuous equipment without utilizing every possible means for increasing the rate of production and lowering the cost of operation, is obviously unsound. It is almost invariably found that continuous processes are inoperable without certain key control instruments. Addition of the remaining instruments necessary for complete automatic control constitute a relatively small investment with a high rate of return.

Referring back again to continuous bleaching, one range with a minimum of instruments requires six operators. With complete instrumentation the number of operators is reduced to two. The output of the range can be as much as ten to eleven times that of an average kier.

The experience of many users of instruments indicates that the average cost of each unit is approximately $750.00. Since their useful life averages ten years, the annual cost including the expense of maintenance and amortization, a reasonable figure for investment return and overhead, is only about $300.00 per instrument. When compared with the savings accomplished, $300.00 seems ridiculously low.

To summarize the economic advantages of instrumentation we find that, for a small original investment, product quality and uniformity are improved, waste is reduced, and production cost is lowered. No other process equipment can do more.

Use of Instruments in the Textile Industry

The question is frequently raised as to where instruments should be used in the textile industry. To answer this question in a most logical manner, it is first necessary to divide all textile operations into three general classes: power, mechanical processing, and chemical processing.

Power instrumentation is a subject in itself and is a well-known science. It is too extensive a subject to discuss here in detail, but the effectiveness of a few well placed integrating flow meters will save their cost many times over. Steam is expensive. Be sure it isn't wasted.

The adaptability of instruments to mechanical processing is somewhat limited. Air conditioning controls, tachometers, and similar devices usually constitute the majority of instruments for this phase of textile operations.

Chemical processing offers almost unlimited opportunity for adaptation of instruments. They are useful wherever the measurement or control of any variable will contribute to process efficiency. Those variables which are most frequently measured and controlled, and which have constituted the backbone of the instrument industry, are flow, liquid level, pressure and temperature. Modern instrumentation, however, goes far beyond these traditional concepts. The measurement of the moisture content or regain of yarn is well established. Control of pH is finding greatly increased utility. More recently developed instruments include those which measure solution concentration by means of specific gravity, oxidation-reduction potential, or electrical conductivity, and those which measure the concentration and/or composition of gases. Spectroscopes, viscometers and other types of laboratory apparatus are being adapted to continuous recording by means of the ElectroniK Potentiometer and are being moved to the plant. Many other new types of instruments are in development.

The subject of instrumentation is so broad and the use of instruments is increasing so rapidly that I can only hope to have suggested some of the potentialities in the short time available to me.

During the course of this paper, I have mentioned only a few of the many instrument applications currently employed in textile finishing mills. I am very sorry that time did not permit a discussion of continuous dyeing. Even though a considerable quantity of literature has been published on instrumentation of textile mills, we have hardly begun to realize the potentialities. All of these current instrument applications amount to a mere scratch on the surface of profitable usage.

The only sure method for realizing the maximum potentialities of automatic control in the textile industry is cooperation between textile and instrument engineers. You, who know far more about textile processing than we ever can, are therefore better able to recognize the problems. Although we have considerable experience with textile instrumentation, our specialty is process control. The combination of your knowledge and ours cannot fail to improve product quality and lower unit costs.

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Change in New York Meeting Dates

THE dates for the first two meetings of the New York Section in 1949 have been changed from January 14th and February 28th to January 28th and March 4th. These meetings will be held at the Hotel New Yorker, New York City.

CALENDAR

PHILADELPHIA SECTION
Meetings: November 12, January 28, 1949 (Kugler's, Philadelphia).

NORTHERN NEW ENGLAND SECTION
Meeting: November 19.

SOUTHEASTERN SECTION
Meeting: December 4 (Atlanta, Ga.).

WESTERN NEW ENGLAND SECTION
Meetings: October 29, December 3, January 14, 1949, February 25, April 8, May 20.

NEW YORK SECTION
Meetings: November 19, January 28, 1949, March 4, April 1, May 6.
Outing: June 17.

PACIFIC COAST SECTION
Meeting: October 15 (Mona Lisa Restaurant, 3343 Wilshire Blvd., Los Angeles, Calif.)

NATIONAL CONVENTION
October 21-23 (Sheraton Bon Air Hotel, Augusta, Ga.).

National Meeting and Convention Augusta, Georgia October 21-23

Headquarters: Sheraton Bon Air Hotel

Publicity for the Augusta Convention

THE Publicity Committee, composed of A. R. Thompson, Chairman, Earl Mauldin, Assistant Chairman, Junius M. Smith and Glenn Bellamy, have had the pleasure of bringing you announcements of the various activities which are planned for the National Convention to be held in Augusta, Georgia, on October 21st to 23rd, 1948. Biographies of the chairmen of the different committees have been prepared and have appeared in the DYESTUFF REPORTER.

The Publicity Committee has endeavored to stimulate interest and attendance at the Augusta National Convention. We have not attempted to describe all of the pleasant surprises which are in store for those who attend the Convention, but this opportunity is taken to suggest that you come early and enjoy the program of scientific and social interest which has been carefully planned to compensate you for sacrifice of time away from your duties while attending the convention.

We hope that your realization of profit and pleasure in attending the Augusta National Convention will far exceed your fondest expectations.

A. R. THOMPSON
Chairman, Publicity Committee

"Art," as he is better known, was born in Lowell, Massachusetts on January 13, 1899 and received his schooling entirely in the city of his birth having attended grade school, high school and Lowell Textile Institute, graduating from the latter in 1922 with a degree of Bachelor of Textile Chemistry. His last two years at LTI were spent as assistant instructor in analytical chemistry. His thesis for his degree "Uses of Hydrosulfite and Related Products in the Textile Industry" led to his first position after graduating in 1922 when he was employed by Rohm and Haas Company in their laboratories at Bristol, Pa. as a research chemist in the application of sodium hydrosulfite and similar products in the textile industry.

He moved to Charlotte, N. C. in 1924 to open the first Southern office for Rohm and Haas Company and was Southern manager for this company until July, 1931. He then went to North Carolina Finishing Company, Salisbury, N. C. as Superintendent until November, 1933 when he moved to Charlotte and became connected with the Sales Department of Ciba Company, Inc., where he has spent the past fifteen years.

Art was married on May 15, 1923 to Madeleine K. Pinkham of Lowell, Mass. He has one married daughter, Charlotte Evelyn of Cartersville, Va., and a son, Arthur Robert, Jr. a midshipman in the third class of the United States Naval Academy at Annapolis, Md.

Art's main hobby is magic and Little Theater acting — minor hobbies include golf and barber shop quartets.

Convention Theme: "Advancing Textiles through Research"

Intersectional Contest Committee, Southeastern Section

HOWARD M. WADDLE
Chairman, Intersectional Contest Committee, Southeastern Section

DR. HOWARD M. WADDLE, head of the Chemical Department, Research Division, West Point Manufacturing Company, Shawmut, Alabama, is Chairman of the Intersectional Contest Committee for the Southeastern Section. Dr. Waddle received his B.S. from Baker University, Baldwin, Kansas, in 1928, his M. S. from the University of Colorado, Boulder, Colorado, in 1930 and his Ph.D from the University of Wisconsin, Madison, Wisconsin, in 1940. He started as an instructor at the Georgia School of Technology, Atlanta, Georgia, in 1930 and rose to Associate Professor. He left this position in 1944 to take over his present work. Dr. Waddle has done research work on the chlorination of esters, naval stores, cellulose chemistry, and application of organic chemistry to textile processing.

Other members of Dr. Waddles's committee are:

A. Kempton Haynes
Rohm & Haas Company, Inc., Atlanta, Georgia.

Matthew T. Barnhill
Avondale Mills, Sylacauga, Alabama.

Charles A. Jones
Georgia School of Technology, Atlanta, Georgia.

Leslie L. Bamberger
Lannett Bleachery & Dye Works, Lanett, Alabama.

S. Jack Davis
Research Division, Callaway Mills Company, LaGrange, Georgia.

The title of the paper which will be presented at the contest in Augusta, Georgia, on October 23rd is "The Effect of Sulfur Black on the Tendering of Cotton Yarns."

The paper will be presented by Dr. Waddle and the judge representing the section will be Dr. James S. Taylor of the Georgia Institute of Technology.

Membership Applications

SENIOR

Ormond W. Howe—Supt. Dyeing & Finishing, Vanity Fair Mills, Monroeville, Ala. Sponsors: A. K. Haynes, S. J. Davis.

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Hans O. Kauffmann—Dir. of Research, Buffalo Electro-Chemical Co., Inc., Buffalo, N. Y. Sponsors: F. X. Nerney, B. K. Easton.

Hermann Kohn—Tech. & Dyer, Corp. Textil La Corona, Havana, Cuba. Sponsors: W. O. Neeb, J. Wauters.

Otto W. Kramer, Jr.—Boss Dyer, Colorcraft Corp. Ltd., San Francisco, Calif. Sponsors: K. MacDowall, H. A. Des Marais.

Everett B. Law—Dyer, Bradford Dyeing Association, Westerly, R. I. Sponsors: R. S. Highling, E. J. Chornyei.

Theodore LeSavoy—Vice Pres., Newport Finishing Corp., Fall River, Mass. Sponsors: E. J. Capuano, P. Strengs.

Hans K. Liffmann—Dyer, Brooklyn Yarn Dye Company, Inc., Brooklyn, N. Y. Sponsors: J. P. Bauer, R. FitzGibbon.

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Carroll F. Martin, Jr.—Demonstrator & Sales., American Aniline Products, Inc., Charlotte, N. C. Sponsors: J. H. Orr, A. S. Cooley.

James L. McIntyre—Supt., Burlington Mills Corp., Neuse, N. C. Sponsors: D. Moss, C. B. Ordway.

Charles P. McClelland—Chem. Sales Development, Carbide & Carbon Chemicals Corp., New York, N. Y. Sponsors: H. B. McClure, C. W. Patton.

Alexander H. McKenzie—Supt. Dyeing & Finishing, Portland Woolen Mills, Inc., Portland, Ore. Sponsors: H. B. Fenn, Jr., T. M. Marshall.

Samuel Machlis—Vice Pres., York Research Laboratories, Inc., Stamford, Conn. Sponsors: J. E. Lynn, J. M. Hood.

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Mariam S. Morse—Instructor, Ohio University, Athens, Ohio. Sponsors: C. W. Dorn, M. L. Rollins.

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John P. Thompson—Sales Engr., General Electric Company, Schenectady, N. Y. Sponsors: J. R. Bonnar, H. F. Herrmann.

Eve E. Turnbull—Asst. Prof., The Ohio State University, Columbus 10, Ohio. Sponsors: C. W. Dorn, J. R. Bonnar.

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Fernand Schlaeppi—Dyestuff Tech., Ciba Company, Basle, Switzerland. Sponsors: J. P. Bauer, E. D. Lind.

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Walter W. Gleadall—Tech. Sales Repres., The Procter & Gamble Distributing Co., Philadelphia, Pa.

Bjorn Gylfe—Tech. Mgr. Dye House, Helsingfors Yllespinneri A.B., Helsingfors, Finland.

Erich A. Hansen—Mgr., Buffalo Electro-Chemical Co., Inc., New York, N. Y.

Bertrand W. Hayward—Director, Philadelphia Textile Inst., Philadelphia, Pa.

Roger B. Hill—Salesman, The Melomoline Co., New York, N. Y.

Alvin W. Horton—Export Mgr., Industrial Exports Corp., Los Angeles, Calif.

William F. Hummel—Salesman, E. I. du Pont de Nemours & Co., Inc., Charlotte, N. C.

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Charles J. Kellogg—Sales Repres., Becco Sales Corp., Buffalo, N. Y.

Hiralal C. Khatiwala—Dye Importer, Jayshanker Keshavram & Co., Bombay, India.

Charles G. Klotzberger—Salesman, E. I. du Pont de Nemours & Co., Inc., Charlotte, N. C.

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Edward J. Mendell—President, Edward Mendell Co., Inc., New York, N. Y.

Miles S. Pendleton—Mgr., Kroy Wool Processors, Inc., Lowell, Mass.

Everett A. Poore—Purch. Agt., Brookneal Mills, Brookneal, Va.

James R. Taylor—Sr. Supervisor, E. I. du Pont de Nemours & Co., Inc., Deepwater, N. J.

Henry F. Tingley—Salesman, Arnold Hoffman & Co., Inc., Providence, R. I.

J. Gordon Waywell—Technician, Colloids, Inc., Newark, N. J.

Henry H. Weldon—President, Compex Chemical Co., Inc., 155 John St., New York, N. Y.

Research Committee Highlights

WOOL DETERGENTS

Hugh Christison, Chairman

Developing a detergency comparator. Evaluation will proceed upon arrival of new model.

COLOR

Dr. E. I. Stearns, Chairman

Proposed test methods for

1. **Dyeing of wool with acid dyes.**
2. **Spectrophotometric examination of dyes in solution.**

STUDENT

Shao L. Soo—Georgia Inst. of Technology. Sponsor: C. A. Jones.

James E. Townsend—Georgia Inst. of Technology. Sponsor: C. A. Jones.

William B. Sutherland, Jr.—Philadelphia Textile Inst. Sponsor: P. Theel.

Kenneth G. McKenzie—Rhode Island School of Design. Sponsor: H. B. Sturtevant.

Raymond R. Walker—Texas Technological College. Sponsor: R. C. Goodwin.

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Jane E. Hathaway — Research Chemist, Midwest Research Inst., Kansas City, Mo. Sponsors: L. G. Johnston, M. R. Woodard.

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48-11

Education: Chemical Engineer, University of Vienna.

Experience: Dyeing and finishing of cotton and synthetic fibers, including application of vats, naphthols and Indigosols, resin finishes, and tricot and tubular goods processing.

Age 45; married, references; U. S. citizen; will go anywhere.

• PATENT DIGEST •

PAUL WENGRAF

Boiling-out Cloth—Apparatus B, 3, 01

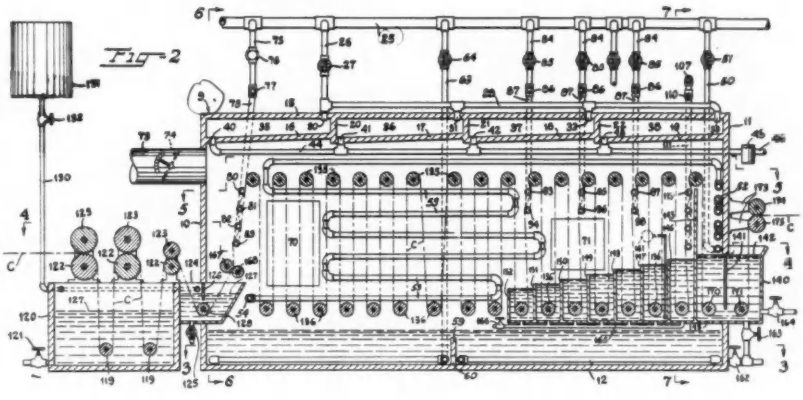
U. S. Pat. 2,441,991

(Sherman Converse and H. A. Woodhead, Jr., May 25, 1948)

The patent relates to an apparatus for boiling-out cloth to render the raw fabrics clean and absorbent and in a suitable condition to be bleached, dyed or both. The apparatus consists of a closed chamber, heated by steam coils, which are immersed in water in the bottom of the chamber. Other steam pipes are fixed in the walls of the chamber. The top portion is heated by steam too. The cloth is impregnated with a suitable caustic soda solution. It enters thereupon the chamber through a water seal and is subjected to steam sprays, hot water sprays and a washing operation. Finally the thoroughly cleaned fabric leaves the chamber by another water seal. These single steps can best be understood by the accompanying drawing (Fig. 2). The cloth designated as "C" passes first through the scouring box (120) filled with caustic and thereupon through the seal trough (124). The material enters the chamber at (126). Perforated steam pipes (81-83) are provided which blow steam on and through the fabric which runs over upper rollers (135) and bottom rollers (136). The bottom of the chamber (9) is filled with water heated by a steam coil so that the whole compartment is always furnished with fresh saturated steam. A plurality of perforated steam pipes (93-98) is located above the container (140) in order to blow steam on the cloth for a second time. Other spray pipes are arranged for spraying hot water at substantially 210° F. between the layers of the fabric in its course upward and downward, whereby a pump (106) drives the water upwards through a manually operated valve (108). This detail can best be seen in Fig. 7. The compartment is divided by a partition (143): the water used for washing the fabric runs in counterflow and the most contaminated water flows through valve (166) into the compartment, being finally drained off by valve (162). The least contaminated water, contained in the outlet sealing trough (142) remains almost pure and can be removed by valve (164).

It is well possible that this apparatus could substitute for the kier boiling process. Although a great quantity of steam is applied, the apparatus is well closed and isolated so that the device may work economically. An advantage is in the continuous and efficient pretreatment of the goods.

Reference is made to U. S. Pat. 1,825,478 (Rowley and Butterworth) which tries to solve the problem of a continuous preboiling and bleaching process by using for the first time J-formed containers which are placed within a closed compartment. This device is characterized by working at normal atmospheric pressure.



U. S. Pat. 2,441,991
Apparatus for Boiling Out Cloth.

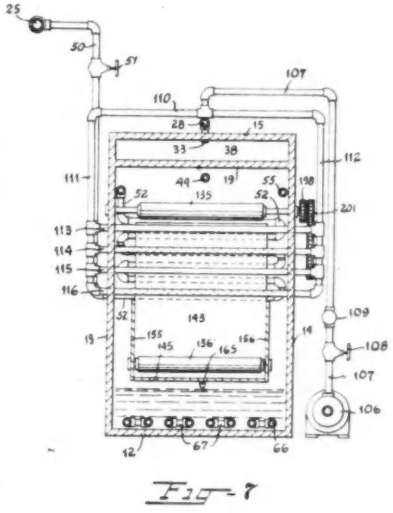


Fig-7

Fumeproofing—Increasing the Resistance by Impregnating with Cyanamid C, 4, 07

U. S. Pat. 2,440,330

(Celanese Corp. of Amer., H. Dreyfus, April 27, 1948)

It is known in the prior art to use nitrogenous products of basic character for making acetate cellulose dyeings more resistant to gas fumes. These bases however are generally sparingly soluble in water so that very dilute, thus not efficient, solutions are available for impregnating the fabrics to be protected. For example the solubility of melamine (being a very good protecting agent) is only about 0.5-1% and that of dicyandiamide is about 2%. It has been found that *cyanamide* which is readily soluble in water gives a good effect too. The solubility of this product enables one to apply 5% solutions and even higher concentrations. An aqueous solution of cyanamide is conventionally prepared by dissolving it at low temperatures (about 40° C.) in water, filtering and passing CO_2 through the filtrate until the Ca- ions are removed by precipitation and filtration. According to an example a fabric dyed with one of the gas fume sensitive blue anthraquinone dyestuffs is padded with a 6% cyanamide solution, containing 50 ml. glacial acetic acid per liter. The fabric is dried and baked for 20 minutes at 130° C. The resistance of the shade to combustion gases is superior to a color not protected by the cyanamide impregnation.

References cited by the Patent Office are, amongst others:

U. S. Pat. 2,331,670 (1943) (Am. Cyanamid): higher substituted cyanamides are used for impregnating textile fibers to produce water repellent or softening effects.

U. S. Pat. 2,318,464 (Courtaulds): improving the dyeing properties of cellu-

losic textiles, especially staple fibers ("Fibro") by a cyanamide phenol formaldehyde treatment.

U. S. Pat. 2,247,353 (Laszlo Auer): suggests to make fabrics crushproof with a calcium cyanamide-formaldehyde solution.

U. S. Pat. 2,234,889 (Courtaulds): improving the dyeing properties by first incorporating cyanamide and later on formaldehyde.

Dyeing Apparatus for Continuous Development of Vat Colors — C, 6

U. S. Pat 2,441,992
(Sherman Converse, May 25, 1948)

Vat colors are best developed, as well known, in a short time and by exposing them to high temperatures. For example any vat dyestuff, developed at 212° F. and within 20 seconds, will be better fixed than in 2-5 min. during treatment at temperatures up to 180° F. On the other hand several of the fastest blue brands (Indanthrene Blue GCD or Ponsol Blue BCS) cannot be dyed in a regular dye bath at higher temperatures because these dyestuffs are destroyed when applied in a reduced condition at elevated temperatures and/or for a longer time. Another drawback is that immature fibers ("dead cotton") show generally up as white specks whatever dyeing method (pigment or reduced vat) is employed. The present invention has the purpose to eliminate this defect of white specks and to give at the same time dyes of a maximum fastness to laundering with all types of dyestuffs. The cloth, indicated here by letter "C" (Fig. 3) enters the steam compartment (10) after impregnation in trough (27). An essential part of the apparatus is the booster box, mounted immediately outside of port (20). This construction is shown with some more details in Fig. 5. It consists of arcuate walls (40 and 41), terminated in plates (45, 46, 47) which form an apron portion of the trough, extending into the interior of the steam compartment. The immersion rolls (50), and at the exit port 50'), are hollow. A cooling liquid can flow through these hollow shafts. The amount of water can be regulated to obtain the temperature desired which is observed at (127). When a predetermined temperature is reached, air is admitted through a diaphragm valve and the flow of water through the jackets (59) and (60) is increased. The purpose is to keep the temperature in the booster trough at a constant low level. In contrast to this low temperature the steam compartment (10) is filled with steam which is permanently regenerated by the water supply (100), heated by coil (106) and sealed at the entrance and exit port so that no steam can escape. Fabric (C) travels through the entrance port over the positively driven rolls (67) and (80), leaving the steam chamber by a port, constructed exactly like the entrance port. The great advantage of this apparatus seems to be that padding is carried out at a low temperature without any damage to the vatted dyestuff solution followed by a sudden temperature increase bringing about a rapid fixation. It differs therefore from the pigment padding construction described in AM. DYEST. REP. 1945, 207 (consisting of pigment padder, hot flue, chemical padder, steam chamber and so on; compare also with Vieira's U. S. Pat. 2,415,379, AM. DYEST. REP. (1945), 206.

It has to be emphasized that pigment padding is deliberately avoided because of the possible disadvantage of showing "dead cotton" specks in many cases. A certain analogy can be found with the less elaborate "Electrofixer" described in Brit. P. 421,237 (I. G. Farbenindustrie A.G.). In this latter patent it was first disclosed that a principal advantage resulted in impregnating with vats at normal temperatures and raising suddenly the temperature thereupon for a short time. Electrical heating means were applied in the device, described in this Brit. patent.

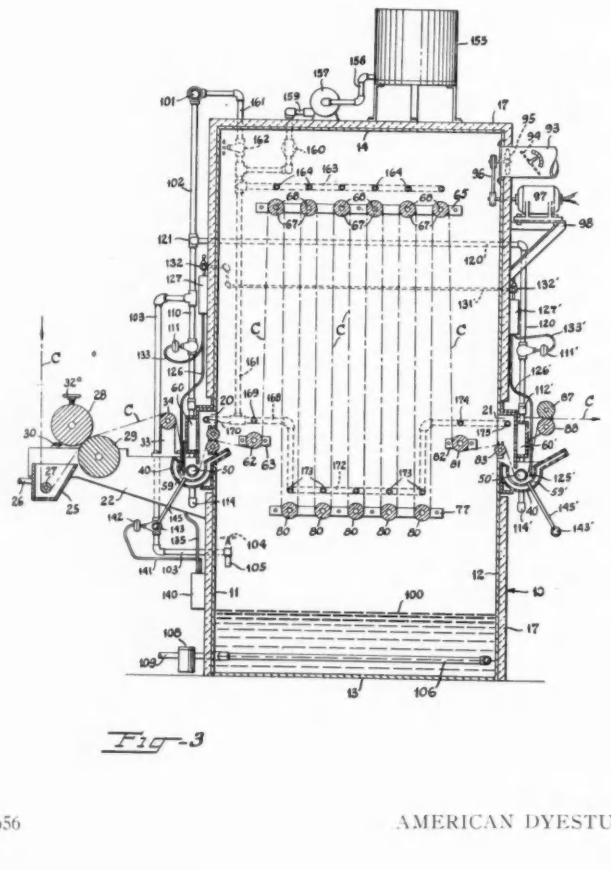


Fig-3

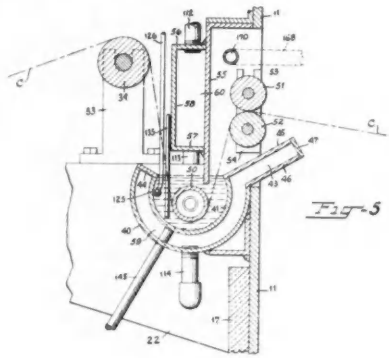


Fig-5

U. S. P. 2,441,992
Dyeing Apparatus.

Printing—Planographic Method—Dyestuff Containing Putties — D, 1

Brit. P. 592,484
(Am. Cyanamid, Kienle-Amick-Kerns, Sept. 19, 1947)

The printing method protected by the present patent differs absolutely from the standard procedure used in printing textiles. The normal roller printing technique can be characterized by the so-called

"intaglio-method" i.e., by applying the color paste from an engraved copper roll. (Some special styles might be printed by relief rollers too, like in printing wallpaper imitation designs). Although this way of printing textiles has been used for more than 100 years there are, as the specification states, some instances where this method is not satisfactory nor economical. It is referred to patterns in which thin lines of different color shades have to be printed one alongside the other; difficulties have been noticed in exactly matching the different colors in delicate shades and in preventing them from bleeding one in the other in case the pastes become too fluid. It is also felt as a drawback that for every shade a separate copper roll is needed, representing a large investment. The procedure recommended in the present patent consists of using a *planographic process* intsead of the intaglio printing method i.e., the reproduction technique employing *a plain colored surface* instead of an engraved one. This suggestion is new, especially in the field of developable colors for instance for vat dyes. The principle is to form *dyestuff containing putties* combined of all the ingredients, necessary for fixation and being flexible but sufficiently stiff to be molded in a pattern. This pattern consists therefore of one single plain plate or optionally of one single roller on which the pattern is affixed and composed from all the different colors to be printed. Thus the formulation for preparing these colored putties is of the greatest importance. The colors must evidently be hard at room temperature during the printing operation in order to resist deformation, but soft when heated, to facilitate cutting in small pieces when the pattern is formed and combined from different colors. After setting the multicolor pattern the surface of the roller or plate (or block in the event of block printing) is smoothed and a previously wetted fabric brought in contact with this surface in accordance with the planographic technique. In an example a thick paste is formed from British gum, flour, starch and water and concentrated until a viscous paste results. Thereupon a vat dyestuff (Indanthrene Blue GCD), Rongalite and alkali are stirred into this paste one after the other at room temperature. The product is dried in vacuo, powdered and homogenized with a small amount of water until the desired consistency is attained. The material is thereupon formed into a suitable printing layer or block, consisting either of one or more shades and placed in a planographic printing machine. A rayon fabric has to be previously wetted out and printed by pressing the block agaignst the fabric, dried, aged and so on. It can be seen that the principal condition for obtaining good results is to have a perfect homogenization and the proper consistence of the colored putties forming the printing elements. They must have the proper softening range without becoming neither too tacky nor too fluid.

Reference is made to the U. S. Patents of Tchechonin, describing patterns, composed from single colored units and applied to the textile material by pressing the wetted fabric against the multicolor layer. The patent numbers are U. S. Pat. 1,999,549/50: colored masses for polychromatic printing consists here of dextrine, glycerol, soap. talc and pigments. U. S. Pat. 2,025,559 gives a formula for a similar dyestuff composition consisting of gum lac, varnish, soap, talc, acetic acid and a pigment. Thus these processes operate quite generally with insoluble pigments.

ABSTRACTS

1949 Spring Men's Hat Colors

Dyestuffs, page 30, Vol. XL, No. 2, Spring-Summer, 1948

Formulas are given for both fur felt and wool felt on the three shades shown in the Spring, 1949, Color Card for Men's Hats, issued by the Textile Color Card Association.

The Coloring of Synthetic Plastics and Resins

B. M. Phelan, Dyestuffs, page 1, Vol. XL, No. 2, Spring-Summer, 1948

Selection of a dyestuff or coloring matter for synthetic plastics and resins depends upon the properties of the resinous material and the equipment available. The dyestuff manufacturer offers products that will color certain types of these materials under the widest practical conditions possible but, while a product may be suitable for one type of synthetic plastic, it may not be suitable for all purposes. Consumer and manufacturer should consult one another to work out the best product for a specific purpose.

A description of the general processes for coloring various members of the thermosetting and thermoplastic groups of synthetic plastics is given. In certain cases operational details are recommended as well as a listing of dyestuffs suitable for coloring these materials.

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50 Years of Textile Research

Julian S. Jacobs, Textile Industries, page 164, Vol. 112, No. 7, July, 1948

Until comparatively recently, textile manufacturers for the most part depended upon their suppliers to work out improvements in machinery and to introduce new chemical compounds. World War II brought about close cooperation between mill, machinery manufacturer and chemical manufacturer which resulted in many important developments in many processes.

The first account of the work at the National Bureau of Standards on textile research was published in 1913; 14 reports were published through 1920, 77 from 1921 to 1930, 139 from 1931 to 1939. This increase in number of publications is indicative of the expansion of work at the Bureau and parallels the increasing interest in research among textile manufacturers.

The article gives the results of numerous surveys on research in the textile and other industries. It is pointed out that, even as recently as 1947, there is a surprisingly small number of textile manufacturers who report that they have research programs.

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50 Years of Progress in Dyeing, Bleaching and Finishing Equipment

H. W. Butterworth, Jr., Textile Industries, page 187, Vol. 112, No. 7, July, 1948.

A period of industrial expansion for textile wet processing machinery began in America about 1900. Vast improvements in production procedures, coupled with the contributions of the engineer, chemist, metallurgist and electronics expert, have enabled the manufacturers of bleaching, dyeing and finishing machinery to design equipment whose speed and precision dwarf those operating at the beginning of the century. The elimination of many separate processes, the combin-

ing of others, and the constant growth during this era toward continuous range production have created higher quality output and also lowered unit costs in finishing. This is a very comprehensive article, amply illustrated, which traces the development of our modern equipment. It is indicated that designing of machinery for the future will require greater cooperative endeavors and a complete understanding between the chemist and the engineer.

Fifty Years of Progress in Fabric Finishing Materials

Arthur E. Hirst, Textile Industries, page 201, Vol. 112, Number 7, July, 1948.

A survey of developments in this field which also includes dyeing, printing and bleaching.

Dyeing of Nylon with Logwood

H. R. Tisdale, Rayon Textile Monthly, page 79, Vol. XXIX, No. 7, July, 1948

Two methods for dyeing nylon with logwood are given. One method is based on a modified formula for logwood on wool and another for logwood on cotton. Instructions are also given for using logwood on mixtures of nylon with wool, viscose rayon and cotton.

Progress Through the Years in Plastics and Textiles

D. S. Plumb, Textile Industries, page 245, Vol. 112, No. 7, July, 1948

Textiles are a good customer for the plastic industry using resins for the finishing of fabrics and for the manufacture of monofilaments used in the weaving of fabrics; plastics serve as an aid in building a market for textiles by their use in the manufacture of coated fabrics; plastics are a challenge to textiles by the development of plastic film products for use in applications formerly served entirely by fabrics. It is estimated that about 40 million pounds of urea and melamine resins were used in textile finishing in 1947, about 25 million pounds of plastics based on synthetic resins were used for textile coating in 1947 exclusive of oilcloth and linoleum, and about 60 million pounds of plastics made from synthetic resins were used in unsupported films in 1947 of which probably 125 million yards were marketed directly through textile channels for textile types of end uses. Nylon and cellulose acetate rayon are not included in these statistics. Textile uses accounted for about 10 percent of the synthetic resin production in 1947. Added to this is about 65 million pounds of nitrocellulose used in the coating of fabric. Textiles are important to plastics as a direct market, as the basis for an industry using both products, and as a pattern for the film industry. All the plastic products concerned with textiles are still on an upward growth curve. A promise of greater markets for both products in years to come is anticipated.

Mercerization and the Barium Number

Sidney M. Edelstein, Textile Age, page 7, Vol. 12, No. 7, July, 1948.

Recent work on the barium numbers of mercerized cottons has shown that this determination can indicate the completeness of the reaction which has taken place between the mercerizing caustic and the cotton. The determination of the barium number of mercerized cotton consists of obtaining the ratio of the amount of barium hydroxide absorbed from an 0.25 normal hydroxide solution by a definite weight of sample to that absorbed by the same weight of unmercerized cotton under identical conditions. Unmercerized cotton is characterized by a barium number of 100 and under ideal mercerizing conditions a barium number of 160 may be obtained.

Other methods of test for the degree of mercerization are reviewed briefly.

Some Miscellaneous Applications of Dyes

J. P. Gill, Journal of the Society of Dyers and Colourists, page 213, Vol. 64, No. 6, June, 1948.

Oil- and wax-soluble dyes are extensively used in materials containing oils, fats, waxes, etc. Their use for the following materials are discussed: polishes, carbon papers, crayons and candles, motor fuels and soap. In many cases selected textile dyes are purified or slightly modified to make them suitable for additional uses. The use of such dyes is discussed for the following materials: foods, metals, plastics, inks, wood-staining. A summary of other minor uses of dyes is given.

Studies on the Absorption of Methylene Blue by Jute Fiber

P. B. Sarkar and H. Chatterjee, Journal of the Society of Dyers and Colourists, page 218, Vol. 64, No. 6, June, 1948.

The absorption of methylene blue by jute fiber is similar to that of acid dyes by wool and very different from that of direct dyes by cellulose. The defatted fiber absorbs about 12 millimols of the dye per 100 g. Absorption is complete within 15 minutes, almost independent of temperature, but depends largely on the pH of the dyebath. Neutral salts have apparently no effect on the dye absorption. The absorption of methylene blue by jute fiber appears to be a reaction similar to that between an acid and base, proceeding most favorably in neutral medium.

Electron Microscopical Studies of Natural Cellluose Fibers

William G. Kinsinger and Charles W. Hock, Industrial and Engineering Chemistry, page 1711, Vol. 40, No. 9, September, 1948.

The coarse fibrils commonly observed by optical and electron microscopy are shown by metallic shadow casting to consist of still finer units. These fine fibrils vary in diameter in a single sample but there are greater differences among fibers of different origins. The diameters of the fibrils in ramie, cotton and wood pulp decrease in that order as do variations in straightness and smoothness of the fibril. A correlation between the character of the fibrils and the physical and chemical properties of the fibers is suggested. There are a number of illustrations.

Vinyon N Resin and Fibers

E. W. Rugeley, T. A. Field, Jr., and G. H. Fremon, Industrial and Engineering Chemistry, page 1724, Vol. 40, No. 9, September, 1948.

Vinyon N fibers are based upon a copolymer of vinyl chloride and acrylonitrile. Greatly improved solvent resistance, better dye affinity and higher softening points have been achieved without sacrificing the high strength, nonflammability, exceptional chemical resistance and immunity to rot and mildew that characterize earlier fibers of the vinyl family. There is considerable discussion of the properties of the resin, manufacturing processes, effect of processing on shrinkage characteristics of yarns, general properties of Vinyon N yarns, and technological significance.

The Redman Process for Controlling Shrinkage of Knitted Fabrics

A. Wyn Williams, Textile Age, page 7, Vol. 12, No. 8, August, 1948.

The Redman process relax-heats knit fabric by mechanical means in the presence of heat and moisture. It dries and shrinks at the same time. No chemicals are

used. The knit fabric enters the machine as it comes from the extractor and is conveyed through the process without tension. By means of heat, moisture and agitation of the fabric the factors responsible for subsequent shrinkage are removed. An experimental machine has been successfully used for the process and is expected to be effective on all types of tubular knit goods.

Unusual Causes of Unlevel Shades in Textile Printing

J. H. Downey, Textile Age, page 34, Vol. 12, No. 8, August, 1948.

Unlevelness in color in textile printing is usually attributed to some failure in the fixation and development of the dyestuffs. A great many of the troubles may, in fact, be traced to this cause. This article, however, deals with the problem of unlevelness from several other points of view and suggests remedies. Among the points discussed are: "lobbing" of rollers, print paste in roller, color dripping from one box to another, overflow at the back of the color box, frothing print pastes, lack of sufficient space for filling in print paste over the whole width of the color box, soiled furnishers, rinsing and neutralizing of the ground shade, film of print paste on unengraved surface of the roller.

New Stevens Laboratory Insures Fabric Quality

William A. Newell, Textile World, page 100, Vol. 98, No. 8, August, 1948.

This article presents a description of the new J. P. Stevens & Co., Inc., laboratory in New York City. This laboratory supplements the company's extensive quality-control facilities. There are numerous illustrations.

Mildew and Mildew Control

U. S. Testing Mill Notes, August 15, 1948.

The area of the United States in which materials are not subject to fungi attack is surprisingly small. One of the most effective weapons for preventing mildew is the removal of the conditions necessary for growth. Chemical fungicides have been developed to kill fungi or prevent their growth. A satisfactory rot-resistance finish must be non-toxic, odorless, colorless, applicable in conjunction with water-repellent finishes, must be effective in small quantities, non-volatile and have no deleterious effect on dyes or fibers. The test method to determine the effectiveness of a mildew-resistant finish is determined by the type of material to be treated, the chemical used for the finish and the end use of the fabric. United States Army Spec. T-1452 is briefly described to illustrate the steps in the testing procedure.

Rayon and Fortisan in Surgery

W. Schweisheimer, The Indian Textile Journal, page 839, Vol. 58, No. 9, June, 1948.

Rayon fulfills the physiologic requirements for an ideal material to be placed in immediate contact with a surface wound: it permits adequate drainage, reduces the friction with the wound to a minimum, prevents capillary invasion as a result of the fineness of the weave, reflects a great reduction of pain and bleeding when dressings are changed, is easily sterilized and withstands autoclaving. Fortisan is being used for high compression bandages for the treatment of serious burns. Fortisan has made excellent sutures because of its fineness and strength, and its smoothness. Whether it will be suitable for an internal suture will have to be determined. Circular knit Fortisan fabrics, laminated with resins, are used to make light, strong, artificial limbs. Fortisan is thoroughly sterilizable.

Fast Color Resist Prints from Indigosol Grounds

T. N. Patrick, Textile World, page 131, Vol. 98, No. 8, August, 1948.

The advantages of using sulfuric acid leuco ester salts of vat dyestuffs for ground shades are listed and a number of suggestions for producing resist prints are given.

Safety Program Can Cut Finishing Accidents

Frank S. McElroy and George R. McCormack, Textile World, page 125, Vol. 98, No. 8, August, 1948.

Bureau of Labor Statistics indicate that injury rates for dyeing and finishing show the least favorable record among the divisions of textile manufacturing. In 1946 the dyeing and finishing rate was 21.7 disabling injuries for every million employee-hours worked as compared to a rate of 19.9 for all manufacturing industries and 16.0 for all textile manufacturing. Studies have indicated that the indirect costs of injury-producing accidents average four times the direct compensation payments plus hospital and medical payments. A survey shows that the most prominent agencies of accidents in the dyeing and finishing field, in descending order of relative importance, are: machines, working surfaces, vehicles, rolled cloth, containers, chemicals, and hand tools. A number of suggestions for eliminating hazards are given.

Publications Abstracted in this Issue

Dyestuffs

National Aniline Division, Allied Chemical & Dye Corp., 40 Rector Street, New York 6, N. Y.

Textile Industries

W. R. C. Smith Publishing Co., Grant Building, Atlanta 3, Georgia.

Textile Age

Textile Age, Inc., 381 Fourth Avenue, New York 16, N. Y.

Rayon

Rayon Publishing Corp., 303 Fifth Avenue, New York 16, N. Y.

Journal of the Society of Dyers and Colourists

32-34 Piccadilly, Bradford, England.

Industrial and Engineering Chemistry

American Chemical Society, 1155 Sixteenth Street, N. W., Washington 6, D. C.

U. S. Testing Mill Notes

U. S. Testing Co., Inc., Park Avenue, Hoboken, New Jersey.

The Indian Textile Journal

The Indian Textile Journal, Lt., "Surya Mahal," Military Square, Fort, Bombay, India.

Textile World

McGraw-Hill Publishing Co., 330 West 42nd Street, New York 18, N. Y.

A.A.T.C.C.
Convention
Issue

October 18, 1948

AMERICAN
DYESTUFF REPORTER

TRADE NOTES • NEW PRODUCTS

• Study on Ramie

Ramie fiber and fabrics offer interesting potentialities to the textile industry, according to a study by Harold T. Coss of the Johns-Manville Corp. and James L. Taylor, Professor of Textile Engineering at the Georgia Institute of Technology. In a research paper on "Ramie Today," Mr. Coss and Dr. Taylor have described in some detail the results of experiments conducted in the Georgia Tech Engineering Experiment Station, the A. French Textile School at Georgia Tech, and the Johns-Manville Research Center.

The authors feel that there is little likelihood that ramie will materially replace cotton, even when handled as stapled fiber on ordinary cotton mill equipment. However, "it is possible to make fabrics from staple ramie that would equal or even out-perform flax fabric (linen) in general wear resistance, and would compare favorably with linen in appearance and hand. Ramie is especially suitable for use in high grade specialty fabrics, where a premium in appearance or serviceability is attractive and desirable."

The ramie fibers studied came from the Philippines, Sumatra, Brazil, West Africa, Cuba, and Florida. Considerable variation in quality and preparation was noted in the Florida fiber, "only a small amount being of the 'wash-decorticated' type" which is most suitable for use. The authors found that several processes could be used to degum ramie fibers, but that close control was necessary. As regards textile processing on cotton mill equipment, proper opening of the fibers after degumming has proved difficult, and special adjustments must be made in the cotton mill equipment before the fibers can be spun.

Ramie yarns and fabrics may be dyed and finished in more or less conventional manners. The fabrics developed were made into summer wearing apparel, table fabrics, draperies, upholstery materials, and kitchen towels. Among industrial products made were packing, heavy canvas, braided wire covering, narrow tapes, and marine cordage. Some of the heavier weight fabrics woven from coarse style yarns take on an attractive worsted appearance.

Much has previously been published on the high strength of ramie, as well as its brittleness. The authors found that fabrics and yarns made from stapled ramie fibers do not retain the high strength of the unstapled fibers, although they are still generally superior to cotton. Brittleness was not found to be an inherent characteristic and can largely be controlled by degumming and finishing treatments.

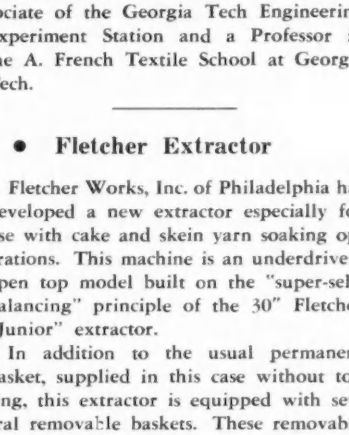
Ramie yarns and fabrics were found to be superior to both cotton and linen in resistance to flexing and to residual shrinkage during repeated launderings, in tearing strength and bursting strength, and in tensile strength while wet. They are superior to linen in resistance to mildew, and the fabrics demonstrated excellent resistance to deterioration due to folding and creasing. The ramie fabric was slightly "cooler" than the cotton in a coolness test on comparable fabrics.

Harold T. Coss is Supervisor of Thermal Insulations and Textile Research of the Johns-Manville Research Center. Dr. James L. Taylor is a Faculty Research Associate of the Georgia Tech Engineering Experiment Station and a Professor in the A. French Textile School at Georgia Tech.

• Fletcher Extractor

Fletcher Works, Inc. of Philadelphia has developed a new extractor especially for use with cake and skein yarn soaking operations. This machine is an underdriven, open top model built on the "super-self-balancing" principle of the 30" Fletcher "Junior" extractor.

In addition to the usual permanent basket, supplied in this case without top ring, this extractor is equipped with several removable baskets. These removable baskets are made entirely of stainless steel, have a unique lifting arrangement, and although they are securely locked in place while running, can be inserted and removed with ease and dispatch.



New Fletcher Extractor

Supplementing the above described extractor itself, Fletcher is offering the trade a complete soaking installation consisting of steam jacketed mixing tank and soaking vats, recovery tank, loading and unloading table, and hoist with monorail.

The advantages of this arrangement are said to include: (1) appreciable saving in labor, (2) less yarn handling with corresponding improvement in quality of yarn, and (3) less floor space required. Furthermore, the initial cost is claimed to be considerably lower than other systems having comparable capacity.

This new extractor will be exhibited for the first time in Section No. 124, at the Southern Textile Exposition, Greenville, S. C., October 4-9, 1948.

• Ground Broken for PTI

Formal ceremonies for the breaking of ground for the new Philadelphia Textile Institute took place on September 15th at School Lane and Henry Avenue, Germantown. A program commencing at 2 P.M. was presided over by Colonel Millard D. Brown, President of The Philadelphia Textile Institute Foundation, before a gathering of more than 400 people. The Invocation was given by Dr. Robert T. Tumbelston of the Philadelphia Textile Institute. Colonel Brown introduced in turn, the following speakers: Richard S. Cox, Dean, Philadelphia Textile Institute, Bertrand W. Hayward, Director, Philadelphia Textile Institute; the Honorable Bernard Samuel, Mayor of Philadelphia; Charles W. Carvin of New York, Chairman of the Foundation's P.T.I. Development Fund; and the principal speaker Harry L. Dalton, Vice-President in charge of sales and public relations, American Viscose Corporation. At the conclusion of the speeches Colonel Brown asked Theodore B. Hayward, Chairman of the Foundation's Building Committee, Alban Eavenson, Charter member of the Foundation, and Bertrand W. Hayward, Director of the Institute to turn a spadeful of earth. Col. Brown was in turn requested to turn the final spadeful, concluding the ceremony.

Among the honored guests on the speakers platform were Edward H. Rakestraw, Russell C. Osborne, Fred C. Scholler, Everett L. Kent, F. Everett Nutter, George M. Ewing the Foundation's architect, Gerhardt J. Lauter the contractor, Arthur C. Kaufman, Robert L. Huffines, Jr., Robert A. Smith and Gerome Leonard.

Architect's sketch of the new Philadelphia Textile Institute to be erected at School House Lane and Henry Avenue, Germantown, Philadelphia, Pennsylvania. It is planned that the building will be ready for occupancy in the fall of 1949.

On display at this occasion were detailed plans of the new Institute for the inspection of all the guests.

The student body of Philadelphia Textile Institute, starting their Fall term, were present at the ceremony.

• Commiteee D-13, ASTM, Fall Meeting

The Fall Meeting of Committee D-13, ASTM, will be held on October 13-15 at the Wardman Park Hotel, Washington, D. C.

• Onyx Bulletin

Onyx Oil & Chemical Company, Jersey City 2, N. J. has issued Technical Bulletin No. TX-2 "Onyx Resins." This bulletin reviews the basic principles of synthetic resin chemistry and discusses the utility of the various Onyx resin solutions and Xyno resin dispersions in the textile and allied industries. Descriptions of the properties and uses of the following products are given: Onyx NCF Paste, Onyx Liquid Resin SS, Xyno Resin AA 40, Xyno Resin S 69, Xyno Resin 362, Xyno Resin 497. A table summarizes the properties of the resins and the resin dispersions. Copies of this bulletin are available upon request.

• duPont Patents Available for Licensing

The Du Pont Company has announced that it is listing a number of its patents on the *Patent Register* of the U. S. Patent Office as available for licensing.

The company said 4,260 patents, which are about two-thirds of the patents the company owns, and which cover many phases of its diversified operations, have been submitted. The first official listing of Du Pont patents is expected to appear in any early issue of the Patent Office Gazette.

Study of the company's patents will be continued to determine what additional listings may be made from time to time, and patents not included in the present registration are not necessarily withheld from consideration for licensing. The present list was compiled only from patents granted since January 1, 1933, as those with only a short remaining life were not considered. The life of a patent is 17 years.

The Public Register of Patents Available for Licensing has been in effect since June, 1945. Du Pont pointed out that registration marks no particular change in its policy as, over the years, the company has licensed many of its patents. It noted that registration appears to be a convenient and practical method of bringing patents to the attention of industry.

• Interchem Finishes Release New Topping

It is stated that new brilliance and gloss for vinyl film, sheeting and coated goods is now made possible by a Clear Topping released by Interchemical Corporation, Finishes Division, 350 Fifth Avenue, N. Y.

This chemical resin coating is said to be remarkably free of any tendency to craze or burnish and has the added advantage of lessening the residual tack inherent in plasticized vinyl compositions, and yet in the course of application, it becomes an integral part of the substrata.

Designed to meet a wide variety of production requirements, Interchem's Clear Topping may be applied by hand or machine methods—can be air brushed, knife spread or roller coated.

The same unique principle of formulation is utilized in Interchemical's machine vinyl printing inks which are available to the trade in either gloss or dull effects.

• Joins Dan River

Raymond K. Briden has joined the fabric development and designing staff of the New York office of Dan River Mills. He formerly was with Lorraine Manufacturing Company, Deering-Milliken and J. W. Valentine Company.

• m-Nitrobenzotrifluoride

The Hooker Electrochemical Company announces a new fluorine containing product in pilot plant production. m-Nitrobenzotrifluoride (m-nitrotrifluoromethylbenzene) is another one of the series which is of particular interest as an intermediate in the preparation of dyestuffs and other fluorine containing compounds.

m-Nitrobenzotrifluoride is a pale straw colored, oily liquid possessing an aromatic odor. The CF_3 group is stable to further chemical reaction. The NO_2 group may be reduced. The product is also subject to further nuclear substitution. A typical ASTM distillation range is 200.5° to 208.5° C; freezing point is —5.0° C; specific gravity is 1.437 at 15.5° C.

Technical Data Sheet No. 365 describing the product more fully is available from the Hooker Electrochemical Company, Niagara Falls, New York.

• Merger of Resinous Products with Rohm & Haas

Merger of The Resinous Products and Chemical Company with the Rohm & Haas Company was approved recently by the stockholders of both companies. The following officers were named: President, Otto Haas; Executive Vice President, Duncan Merriwether; Vice President, C. E. Andrews, A. L. Blount, R. A. Connor, L. W. Covert, D. S. Frederick, E. L. Helwig, L. Klein; Secretary, S. C. Kelton; Treasurer, W. T. McClintock; Assistant Secretary, J. F. Bergin, P. J. Clarke, William Kohler; Assistant Treasurer, T. V. Monahan, George Schnabel. The directors of the company are: Otto Haas, Chairman; E. C. B. Kirsopp, Vice Chairman; William W. Bodine, R. A. Connor, L. W. Covert, D. S. Frederick, W. J. Friedman, F. O. Haas, John C. Haas, S. C. Kelton, L. Klein, Duncan Merriwether.

The relationship between the two firms prior to yesterday's merger had been very close. The controlling stock interest in both companies was held by the same group, and manufacturing and selling operations were interrelated.

Since its organization in 1926, The Resinous Products and Chemical Company pioneered in the development and manufacture of synthetic resins for the

coatings, plywood, paper and other industries; it is one of the leading producers in this field, its resins being distributed throughout the world under a number of trade names including: Amberol, Uformite, Aquaplex, Duraplex, Paraplex and Amberlite.

The business of Rohm & Haas was started in Philadelphia in 1909 to manufacture and sell Oropon, the original enzyme bate, and other products important to the leather industry. World War I brought the company into prominence as suppliers of industrial chemicals. Its present list of products include those for the leather, textile, insecticide, plastics and other industries. Plants are operated at Philadelphia, Pa., Bristol, Pa., Knoxville, Tenn., and Houston, Texas.

"It is our conviction", said Mr. Haas, "that the simplifying of our operations as a result of the merger will enable us to do a better job of serving the customers of both companies. Our assets in manpower and in research and production facilities have been strengthened. By mobilizing under unified management the research and production specialists of both organizations, the merger equips us to extend our products and services into a number of rapidly expanding fields of industry."

• Dye Catalog

One of the world's most complete dye color catalogs, prepared by I. G. Farbenindustrie of Germany, is now available to interested American firms on a no-charge loan basis, John C. Green, Director of the Office of Technical Services, Department of Commerce, announced recently.

The catalog, consisting of fifty-seven volumes, contains dyed samples of bleached and unbleached cotton, rayon, silk, weighted silk, silk and cotton, etc. Concentrations of the impregnating and developing baths are given as well as the fastness properties of the dyes and notes on the choice of suitable dyestuffs for various purposes. Most of the text is in German.

A list of the specific volumes, indicating the contents of each, appears in the August 1948 issue of the *Bibliography of Scientific and Industrial Reports* available from the Office of Technical Services at $1.00 per copy.

Mr. Green asked firms interested in borrowing the collection to write to him in care of the Office of Technical Services, Department of Commerce, Washington 25, D. C. Each firm will be entitled to a thirty-day loan on a first-come first-served basis, with shipping charges to and from the firm to be paid by the user.

• Mathieson Director of Research

Dr. Carl F. Prutton (above), formerly head of the department of chemistry and chemical engineering at Case School of Applied Science, has joined Mathieson Chemical Corporation as Director of Research, it has been announced by Thomas S. Nichols, president and chairman of the board. He will have headquarters in Mathieson's executive offices in New York and at research laboratories in Niagara Falls.

Dr. Prutton was a faculty member at Case from the time of his graduation from that school in 1920 until 1948. He was a consultant to the Lubrizol Corporation from 1928 until he joined Mathieson and a consultant to The Dow Chemical Company from 1928 until 1941. From 1942 to 1944 he served as Chief of the Process Development Branch of the Office of Rubber Director and was also consultant to the War Production Board.

Graduating in 1920 as a Bachelor of Science, Dr. Prutton obtained his master's degree from Case in 1923 and his Ph.D. in chemistry from Western Reserve University in 1928. He is the author of many scientific papers in the fields of physical chemistry, lubricants, corrosion, chemical engineering and education, and since 1944 has been a member of the Editorial Advisory Board of Industrial and Engineering Chemistry. He holds over a hundred patents on petroleum products, chemical processes and plastics.

Among the numerous scientific organizations of which Dr. Prutton is a member are the American Chemical Society, American Institute of Chemical Engineers, Society of Automotive Engineers, American Petroleum Institute, Electrochemical Society, and Society of Plastics Engineers.

• Joins U. S. Testing

Dr. Clarence W. Winchell, who recently resigned as Chief of the Bureau of Standards of New Jersey, has joined the staff of the United States Testing Company, Inc., Hoboken, N. J. Dr. Winchell will have charge of preparing specifications and standardization for official purchasing commissions and institutions, developing sources of materials and testing these materials for specific use. The creation of this new service for government and industry by the Testing Company is designed to aid in the flow of American products abroad and for state purchasing boards.

Dr. Winchell's first activity will be assisting the State of Oklahoma to set up a purchasing operation based on his experience in New Jersey and the United States Army. He served in both World War I and II as laboratory officer in field and laboratory supervisory duties.

Dr. Winchell is a graduate of Rutgers University and did post graduate work at Columbia University, City College of New York and Rutgers. He is a member of the American Chemical Society, American Society for Testing Materials, National Association, State Purchasing Officials (Executive Board) and consultant for the National Institute of Governmental Purchasing.

• New Calco Technical Bulletin

A new Calco Technical Bulletin No. 804, "The Properties and Applications of Ultramarine Blue", has been announced by the Calco Chemical Division, American Cyanamid Company. The paper discusses the early history of the natural color pigment and the introduction of its artificial counterpart. It discusses the complex composition of Ultramarine Blue, its chemical and physical properties, as well as the theories which have been advanced to acount for its blue color.

The importance of the pigment in protective and decorative coatings, printing inks and related aplications, is pointed out and attention is called to the basic principles which should guide the formulator in using Ultramarine Blue.

A copy of this bulletin may be obtained through your Calco representative or by addressing your request to the Advertising Department, Calco Chemical Division, American Cyanamid Company, Bound Brook, N. J.

• New du Pont Dyes

Three new anthraquinone vat dyes have been developed by the Dyestuffs Division of the Du Pont Company, it was announced recently.

They are "Ponsol" Brilliant Orange RK Paste, "Ponsol" Gray R Paste, and "Ponsol" Red GLL Paste.

"Ponsol" Brilliant Orange RK Paste produces a brilliant tangerine shade that, it is claimed, cannot be reproduced with other anthraquinone vat dyes. It is said to possess good resistance to chlorine, washing, crocking, hot moist pressing, dry cleaning, and salt water spotting. It is stated that it also has good fastness to light and peroxide bleaching and is recommended for fabrics that must withstand weathering or that require a combination of light fastness and good resistance to wet processing. It is suitable for dyeing cotton and viscose process rayon in all forms.

"Ponsol" Gray R Paste produces gray shades with a desirable neutral tone. It will serve as a base for a wide range of attractive grays said to have very good fastness to light. It is stated that it exhibits generally good resistance to various wet processing treatments and is suitable for dyeing cotton and viscose process rayon in all stages of manufacture. It is recommended for shirtings, industrial uniform cloths, draperies, dress goods and other fabrics where good fastness to light and laundering is required.

"Ponsol" Red GLL Paste gives pink and red shades said to possess an unusual degree of light fastness. It yields attractive self shades and is useful as a base for light-fast rose shades. It is recommended for upholstery fabrics, drapery materials and other use where excellent light fastness is essential.

• New CCCC Glycols

Carbide and Carbon Chemicals Corporation has announced commercial production of three new glycols; butanediol-1,3: 2-methylpentanediol-2,4; and octylene glycol.

This is the first commercial production in the United States of butanediol. It is a mild-odored, colorless liquid, miscible in all proportions with water and alcohol. It is less volatile and more viscous than its lower homologs, ethylene glycol and propylene glycol. The hygroscopicity of butanediol is about 60 per cent that of glycerol and three times that of octylene glycol. Its derivatives are less water soluble and more soluble in hydrocarbons than those of ethylene glycol.

Methylpentanediol is a colorless liquid with a mild hygroscopicity, retaining a constant moisture content over a wide range of humidity. It is miscible with water; the lower alcohols, ethers, ketones and esters; chloroform; and ethylene dichloride.

Octylene glycol is a colorless, 1,3 diol of low volatility and limited water-solubility. It is the first commercially available glycol having limited water-solubility. Its viscosity is much greater than that of the lower diols, but less than that of glycerol. It is about one-tenth as hygroscopic as glycerol at 65 per cent relative humidity and at 21 deg. C.

These new glycols are good plasticizers and softeners for animal glues, casein, cork gelatin, polyamide resins and zein compositions. They are useful as coupling or blending agents for cosmetic creams and metal cutting, leather, and textile oils, and as solvents for essential oils, natural gums and resins. They are also used as intermediates for alkyd resins and plasticizers for synthetic resins.

• Depcofix A

DePaul Chemical Company Inc., 44-27 Purvis Street, Long Island City, N. Y., announces the development of Depcofix A, a fixative for direct dyes. It is of particular value for goods printed with direct colors as it is said to eliminate bleeding, migration, staining or marking-off during processing. It is further said to improve water fastness as well as wash fastness of heavily dyed direct colors.

• General Aniline Appointments

General Aniline & Film Corporation announced the following appointments at its Grasselli, N. J., plant:

Dr. Chris C. Schulze as a section leader in the Vat Colors Section of the Process Development Department; Dr. Robert C. Wilson as section leader in the Ansco photographic chemicals section, and Joseph S. Milazzo as assistant production supervisor in the Vat Colors Department.

Dr. Wilson received his B.S. degree in 1935 and his M.S. in 1936 at North Texas State College. He received his Ph.D. at Texas University in 1941, and joined the General Aniline research staff seven years ago. Dr. Wilson is a member of Phi Lambda Upsilon and Sigma Xi fraternities and the American Chemical Society.

Dr. Schulze received his M.S. in 1940 and his Ph.D. in 1942 at State University of Iowa. Before joining General Aniline in 1942, he was engaged in research for the National Defense Research Committee. Dr. Schulze is a member of Alpha Chi Sigma, the American Chemical Society and the National Professional Chemical Society.

Mr. Milazzo was graduated from Thomas Jefferson High Schol in 1935. Before becoming a laboratory helper in the Vat Colors Department in 1939, Mr. Milazzo was employed by Volupte, Inc. He enrolled for night courses as a chemical engineering student at Newark College of Engineering and received his B.S. in 1948.

• Heyden Acquires Rumford Subject to Approval

Heyden Chemical Corporation disclosed recently the acquisition, under certain conditions, of the assets of Rumford Chemical Works, Providence, R. I.

B. R. Armour, President of Heyden, and A. E. Marshall, President of Rumford Works, announced that Heyden and Rumford had entered into an agreement pursuant to which Heyden would, subject to certain conditions, acquire all the assets of Rumford in consideration of the assumption of all of Rumford's liabilities and the issuance to Rumford of 99,438 shares of Heyden's common stock.

The agreement has been approved by the Board of Directors of both companies, but is subject to the approval of Rumford stockholders who were to pass upon the proposal at a meeting called for September 27, 1948.

The agreement may be terminated by Rumford for any reason at any time prior to November 15, 1948. Heyden has the option to terminate the agreement unless it is approved by the holders of at least 75 per cent of Rumford stock, the favorable vote of the holders of two-thirds of the Rumford stock being required by Rhode Island law.

Rumford manufactures and distributes chemicals and foodstuffs, primarily phosphate chemicals and making powders, including the well-known Rumford brand of baking powder.

• Two New Proctor & Schwartz Catalogs

Proctor & Schwartz, Inc., Seventh Street and Tabor Road, Philadelphia 20, Pennsylvania announce publication of two new catalogs. One catalog describes modern batt making with the Proctor completely automatic system and the other is concerned with the Proctor automatic boarding, drying, stripping, piling and counting machine for hosiery. Copies of these bulletins are available upon request: "Proctor Hosiery Catalog—Bulletin 326" and "Modern Batt Making—Bulletin 328".

• Birch Brothers Circulars

Birch Brothers, Inc., Somerville, Mass.

have the following new circulars available for distribution upon request:

No. 1041 Ball Bearing Adjustable Spiral Opening Unit.

No. 745 Individual Vacuum Extractor with a Patent Adjustable Slot Vacuum Extracting Box.

No. 1025 Heavy Squeeze Roll Unit for Padding or Extracting—30,000 lbs. capacity.

No. 1040 Vacuum Pump Unit and Strainer.

No. 988 Diagram of Cloth Opening Ranges showing one Vacuum Extractor the other Heavy Squeeze Roll Extractor.

• Promotion on Lanaset

American Cyanamid Company's Textile Resin Department is developing an intensive national promotion featuring washable all-wool shirts and jacket shirts treated with Cyanamid's Lanaset Resin. A full-page color advertisement in *Parent's Magazine* will appear in October.

Promotion kits are being supplied to approximately 1300 stores who retail the products of Ace Sportswear Company, The American Pad & Textile Company, Boyswear, Inc., Clover Boys' Wear, Lakeland Manufacturing Company, Monarch Manufacturing Company, Milwaukee, Jules L. Simon & Company and others.

Included in the promotion kit will be a wide range of layouts for newspaper advertisements, publicity releases, suggested plans for window displays, interior displays and other promotional material.

The promotion will be launched for the trade with advertisements in *Daily News Record, Women's Wear Daily, Men's Wear* and *Boys' Outfitter.*

• New Quaker Addition

Quaker Chemical Products Corp., of Conshohocken, Pa., in order to take care of expanding business, has recently let contracts for the erection of additional plant space.

This addition will occupy ground recently acquired by the Corporation and will cover approximately 20,000 sq. ft. The building is expected to be completed at the end of the year.

• LTI Appointment

The appointment of Everett V. Olsen of North Chelmsford, Mass. to the newly created post of assistant to the president, was announced today by President Kenneth R. Fox of the Lowell Textile Institute.

The expansion of the Institute to over double its prewar size and the extensive building program have made it necessary to create the new post in order to relieve the president of some of the administrative details, according to President Fox.

Mr. Olsen will assist President Fox in the supervision of non-academic personnel and the handling of many of the operational details of the Institute's expanding program. He will operate as a liaison between the Institute and the state department of education and other state agencies.

Mr. Olsen comes to the Institute from the University of Massachusetts at Fort Devens where for the past two years he was director of personnel and performed duties very similar to his new post.

He is a graduate of Chelmsford High School and attended Lowell Evening Textile School. After experience as cashier and auditor with several firms he went to Fort Devens as civilian chief of the payroll and time department before entering the service. Following his discharge, he was employed at Fort Devens as office manager and fiscal accountant before taking up his duties with the University of Massachusetts.

• Fall Meeting, American Oil Chemists

Emphasis will be placed on the glyceridic oil field at the 22nd annual fall meeting of the American Oil Chemists' Society at the Hotel Pennsylvania, New York City, on November 15-17, according to the program chairman, H. W. Vahlteich, of Best Foods Inc., Bayonne, N. J. The three-day technical program will also offer papers on soap, drying oils, and general topics, with one group to be presented by representatives of government laboratories. General Chairman is Foster Dee Snell of Foster D. Snell Inc., New York City. Sessions are open to the public.

• Second Class, ITT

Dean George H. Coleman of the Institute of Textile Technology, has just announced a list of fifteen carefully-selected college graduates who compose the second class to enter the Institute. They reported on September 13 for a two-week period of indoctrination.

These men, all of whom will attend the Institute on scholarships, will work toward the degrees, master of science and doctor of philosophy, both of which the Institute is empowered to grant.

On September 27 they were joined at the Institute by last year's class members who have spent the Summer working in mills which are members of the Institute.

The new class is composed of the following: Donald R. Aichner, Erie, Pa.; Edward Artim, Clifton, N. J.; Charles S. Baker, III, Cape May, N. J.; John S. Brice, Cedar Rapids, Iowa; George M. Bryant, Anniston, Ala.; Richard L. Fowler, Spartanburg, S. C.; Claude F. Hughes, Jr., Roanoke, Va.; Joseph S. James, Jr., Richmond, Va.; Richard L. McCullough, Milford, Mich.; Charles B. Palmer, Rosedale, L. I., N. Y.; Stuart E. Penner, Lawrence, N. Y.; DeWitt R. Petterson, Roanoke, Va.; J. Steve Powell, Fort Worth, Texas; James F. Sayre, Dunbar, W. Va.; and Norman W. Touchette, Belleville, Ill.

The Institute of Textile Technology is a co-operative research organization sponsored by a large number of member textile mills. It combines fundamental and applied research work with a teaching program on the graduate level. Each year a class limited to 15 students is admitted. In this way, the Institute will provide a reservoir of highly-trained young men for the textile industry.

OBITUARY

JOHN O'BRIEN

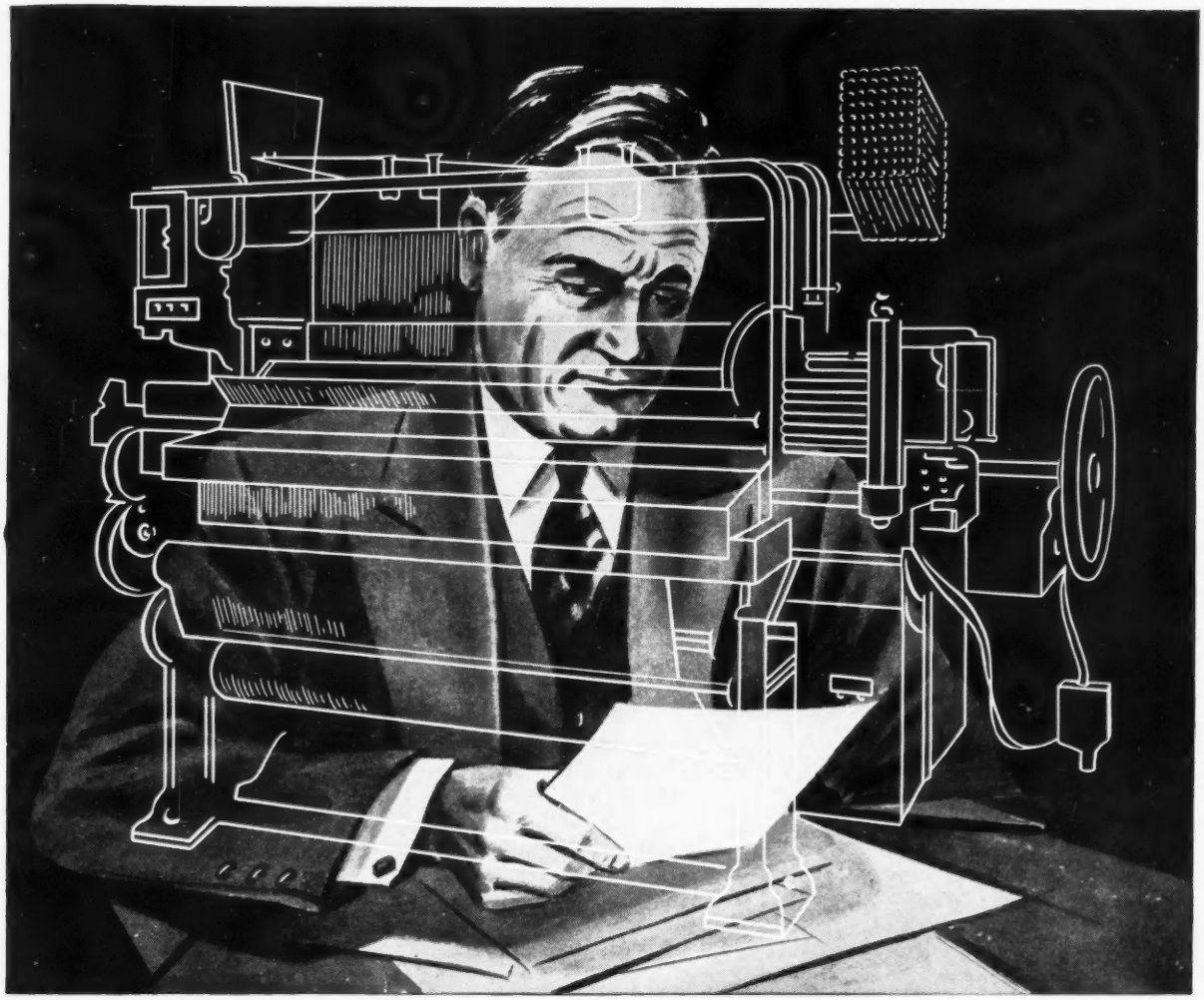
FUNERAL services for John O'Brien, divisional manager of Chicago industrial sales for the Colgate-Palmolive-Peet Company, were held at Bourne's Chapel, Chicago, on Friday, September 3, at 3 p.m. Interment took place at Fairmont Cemetery, Chicago, Ill.

John O'Brien

Mr. O'Brien, who resided in Chicago, was a passenger on an airplane that crashed en route from Chicago to Superior, Wis., Sunday evening, Aug. 29.

Mr. O'Brien had been employed by the Colgate-Palmolive-Peet Company for 21 years. He started as a clerk in the Home Office Industrial Sales Department in Jersey City, N. J. He became industrial salesman, sales supervisor and divisional manager in the department.

Surviving are his widow, a daughter, two brothers and three sisters.



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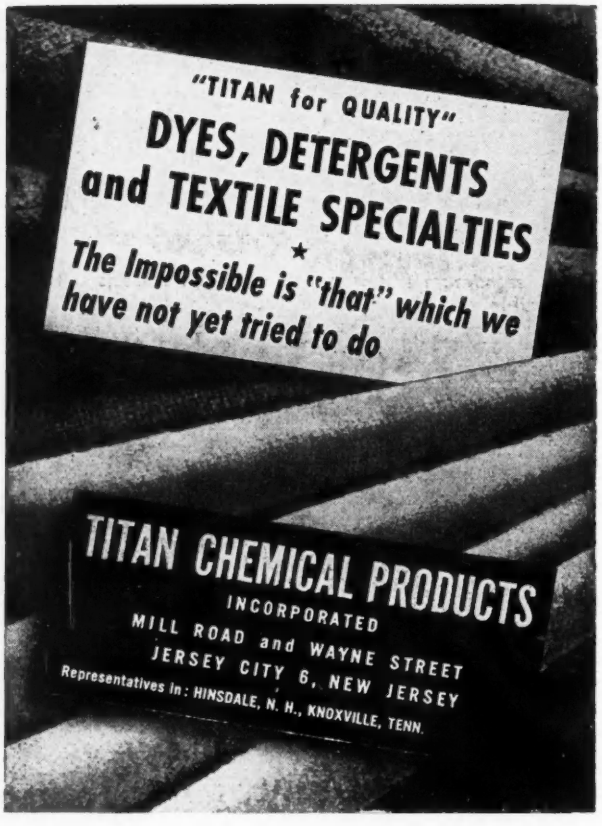
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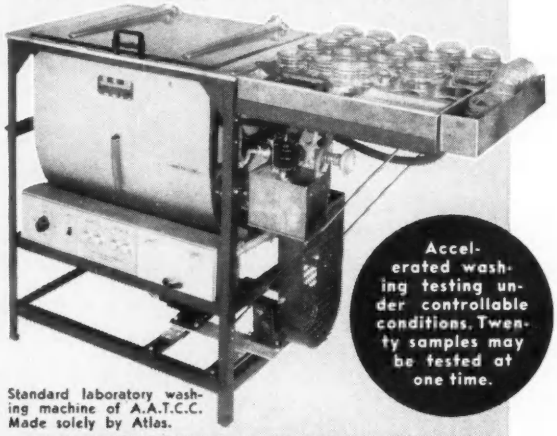

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BURKART-SCHIER CHEMICAL CO., CHATTANOOGA, TENN.

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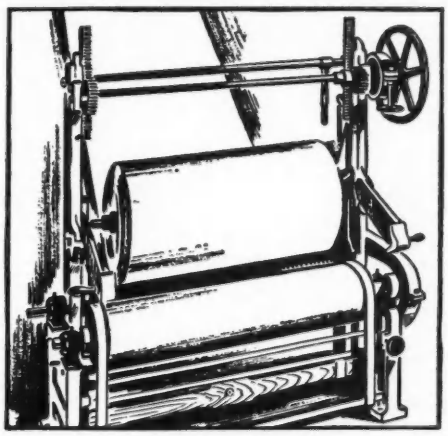

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SAVES MONEY!

REDUCES SOAP AND LABOR COSTS!

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Designed to effect exceptionally uniform soaping of woolens and worsteds before fulling, it can also be used as a unit in soap distributing systems. A one-man operation (instead of the usual two), it is capable of speeds as high as 40 yards per minute even on heavy weight fabrics.

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FOOT OF SUFFOLK STREET, LOWELL, MASS.

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OF FINISHING EQUIPMENT

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Reg. U. S. A. and Canada
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FINISHES

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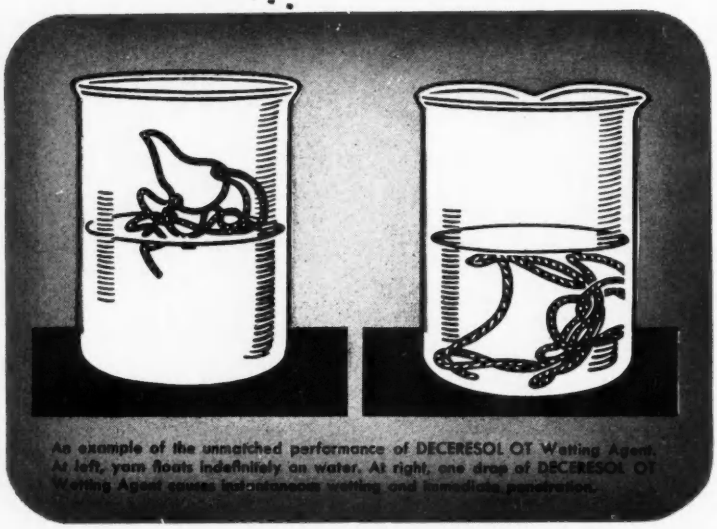

An example of the unmatched performance of DECERESOL OT Wetting Agent. At left, yarn floats indefinitely on water. At right, one drop of DECERESOL OT Wetting Agent causes instantaneous wetting and immediate penetration.

...DECERESOL OT Wetting Agents

You get speedier application in the wetting of textiles – better penetration, dispersing and dye levelling properties – when you standardize on Cyanamid's DECERESOL* OT Wetting Agents, now again available in larger quantities.

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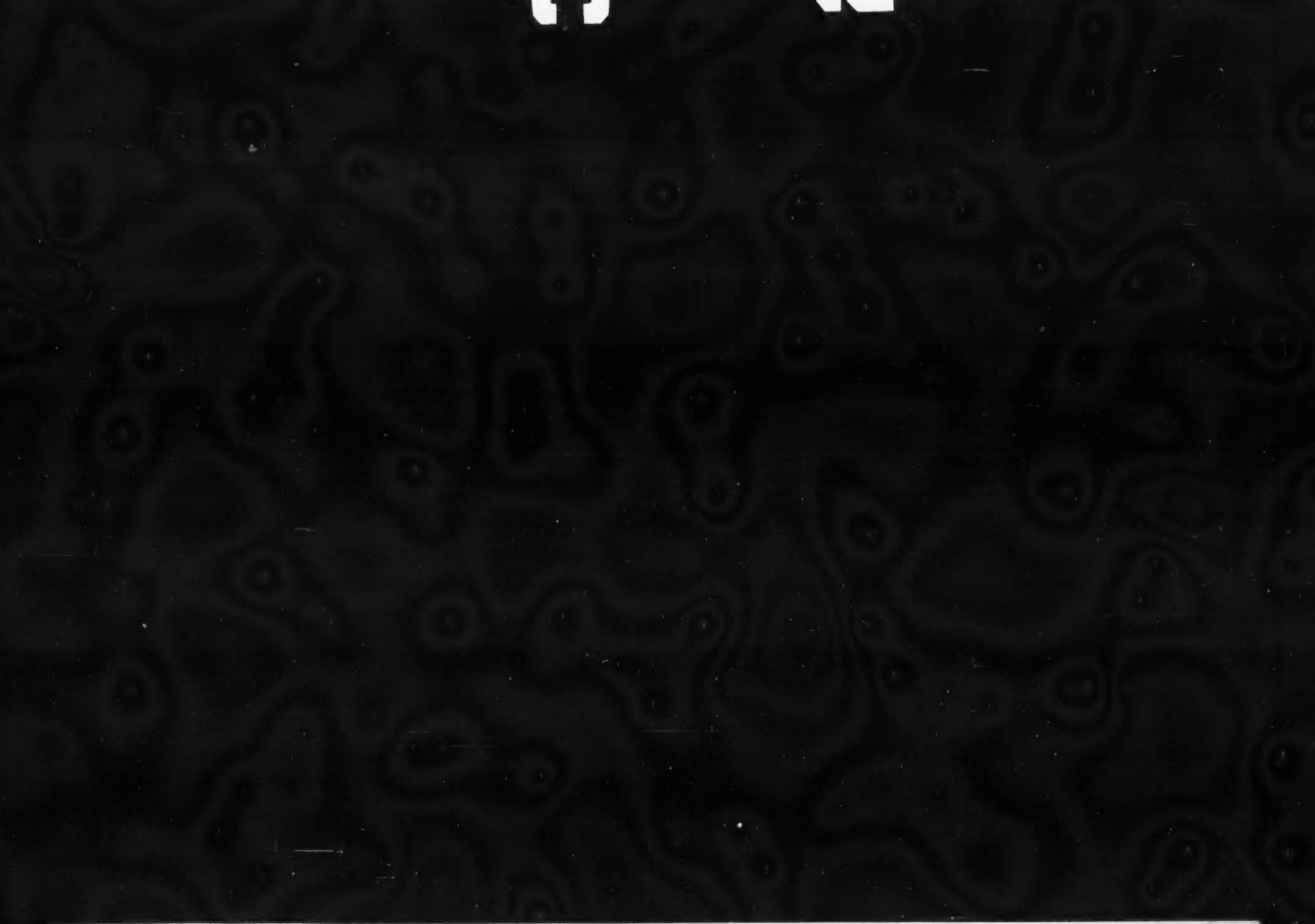
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